

SOMMAIRE

OFF TO A GOOD START!

The journey of the ambitious five-year partnership officially began with an inspiring two-day kick-off meeting!



Bringing together 220 participants from Europe and beyond, the event served as a platform for participants to align on the partnership's multifaceted goals. Through detailed discussions, the participants reviewed all work packages contents that form the backbone of this Partnership.

Attendees represented a broad spectrum of stakeholders, including waste management organisations, technical safety organisations, research entities, regulators and civil society experts, showcasing the Consortium's commitment to sustainable impact.

As highlighted by the Chief Scientific Officers, EURAD-2 is the largest multinational programme in the world focused on radioactive waste management. The Consortium must be up to strengthen European leadership in radioactive waste management.

Over the next five years, this Consortium will strive to meet its ambitious goals, with the foundation laid during these two days serving as a promising start.

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safe solutions for radioactive waste

The IGD-TP Executive Group of WMOs are excited for the launch of EURAD-2, for continuing the strong momentum of our communities working together for holistic waste management and supporting the aim of IGD-TP for addressing scientific, technological and social challenges. We are involved in numerous work packages together and look forward to strengthening collaboration in implementing the SRA and our vision of industrialisation of radioactive waste disposal in Europe by 2040. We would also like the community to be aware that the WMOs plan to host an Exchange Forum in Prague in autumn 2025, hosted by SURAO as the new chair of IGD-TP Executive Group. We hope this event will also serve as a great location to share ideas about priorities for potential (new) EURAD-2 wave 2 Work Packages. Stay tuned for more information. <https://igdtp.eu/> secretariat@igdtp.eu



Transfer of IGD-TP chairperson and secretariat roles from Posiva (Tiina Jalonen and Johanna Hansen) to SÚRAO (Markéta Dohnálková and Lucie Hausmannová), November 2024



EuradScience is an independent, cross-disciplinary, inclusive network of Research Institutions in Europe. It was established with the vision for promoting scientific excellence and providing a holistic view from relevant scientific disciplines necessary to advance the progress of radioactive waste management programmes and to continuously support the credibility of waste management concepts. As of fall 2024, EuradScience comprises 29 European research organisations with memberships expected to grow further.

In the EURAD-2 program, EuradScience represents the College of Research Entities, alongside the relevant Bureau members, and works closely with complementary networks such as IGD-TP (Implementing Geological Disposal of radioactive waste - Technology Platform, established and led by Waste Management Organisations) and SITEX (a network of Technical Support Organisations to national regulators).

The members of the EuradScience Steering Committee are:

- Marcus Altmaier, KIT (Chair)
- Sergey Churakov, PSI
- David García, Amphos 21
- Liz Harvey, Galson Sciences Limited
- Didier Leonard, SCK CEN

The next EuradScience General Assembly will be held in early 2025. The official date will be communicated soon. A comprehensive description of EuradScience activities will be provided in a forthcoming EURAD-2 newsletter.

For any questions or comments, please contact the EuradScience secretariat: EuradScience@sckcen.be



In EURAD-2 SITEX.Network will continue to facilitate the interactions within the TSO College and to share and defend its views with the other colleges. Compared to EURAD-1, our TSO College has the pleasure to welcome new TSOs (or more generally new organisations with an Expertise Function, supporting the Regulatory Function)!

EURAD-2 will be a new exciting adventure, with more Work Packages than in EURAD-1 and more partners. A good coordination between our organisation is thus of great importance. This coordination will be organised at different levels:

- *In the Bureau, your TSO representatives are Kateryna Fuzik, Christophe Debayle and Valéry Detilleux;*
- *In TSO College meetings. Regular meetings will be organised by SITEX.Network to prepare strategic decisions and network on TSO activities in the different EURAD-2 WPs. More info will come early next year.*
- *In SITEX.Network management board, meeting monthly notably to address EURAD-2 aspects.*

Do not hesitate to reach out with us (secretary@sitex.network) !

Did you know?

- *SITEX.Network presented its activities during a special TSO Role session of the IAEA TSO Conference (2-6/12/2024). – see picture*
- *SITEX.Network organises a **Topical Day** on the consideration of Human Intrusion in Safety Cases for radioactive waste disposal facilities (11-12/02/2024, Vienna) – for more info and registration: [see our website](#)*





(Development and improvement of thermodynamic understanding for use in nuclear waste disposal safety case)

The **Work Package DITUSC** (devoted to the use of thermodynamic approaches in the safety case for the disposal of Radioactive Waste) was successfully launched with its **kick-off meeting** and first **open workshop on thermodynamic databases (TDBs)**, held from 13 to 15 November 2024 in Barcelona. These events paved the way for an ambitious project aimed at developing a vision striving for a better management of scientific uncertainties related to thermodynamic (e.g., data gaps) in radioactive waste management.



Participants to the workshop – Barcelona (Spain) 14-15 November

STRUCTURING DISCUSSIONS AT THE KICK-OFF

The **kick-off meeting** on 13 November brought together a large community of researchers, technical safety organisations and radioactive waste managers. After a presentation of the overall objectives of DITUSC, discussions addressed key issues such as **gaps in thermodynamic data** and the **integration of thermodynamic models** into safety analyses. This initial exchange enabled

the partners to align their expectations and plan the next steps.

A WORKSHOP DEDICATED TO THERMODYNAMIC DATABASES

On 14 and 15 November, a technical workshop explored the contributions of thermodynamic databases (TDBs) to radioactive waste management and disposal in particular. Presentations by international

experts, covering key ongoing TDB projects in the nuclear waste disposal field and beyond (NEA-TDB, ThermoChimie, Thereda, NagrapSI, JAEA-TDB, WIPP-TDB, CEMDATA, Thermoddem and Prodata), enriched the discussions and helped identify possible synergies. Emphasis was placed on the current status of these TDBs with a special focus on identification of relevant data gaps, and methods for circumventing these gaps, priorities and future plans.

DITUSC SURVEY: A KEY TOOL FOR 2025

In order to gain a better understanding of the needs of the various stakeholders represented in the three EURAD-2 Colleges, a **survey will be launched in early 2025**.

Designed to gather feedback from a variety of actors (e.g., researchers, radioactive waste agencies, regulators and their supporting organisations), it will aim to identify priorities for the development of TDBs and inform the drafting of **Green and White Papers** to guide future efforts.

These initial events demonstrate DITUSC's commitment to rigorously integrating scientific actors into strategic decisions related to the use of thermodynamic approaches in radioactive waste management. The next steps will include a second workshop in fall 2025 and an in-depth analysis of the survey feedback.

The banner features a colorful city skyline of Nantes at the bottom. At the top left is the logo for IMT Atlantique, Bretagne-Pays de la Loire, Ecole Mines-Técom. The word 'NANTES' is written in large, multi-colored letters. Below it, the text reads 'DEVELOPMENT AND IMPROVEMENT OF THERMODYNAMIC UNDERSTANDING FOR USE IN NUCLEAR WASTE DISPOSAL SAFETY CASE'. Underneath that, it says 'FALL 2025'. On the right side, a yellow box contains two bullet points: (i) Feedback survey and (ii) Prioritization of knowledge/data gaps in relation to the Safety Case. At the bottom left, there is a logo for DITUSC with the dates '14-15 November 2024 (Barcelona)' and the text 'DITUSC: a key tool for exchange with TDB projects'.

CLIMATE (Impact of climate change on nuclear waste management)

CLIMATE focuses on the impact of human-driven climate change on radioactive waste management facilities across Europe. Climate change impacts include sea levels rise, changes in hydrological conditions and frequency of extreme weather events (e.g., floods and landslides), posing potential risks to nuclear waste facilities.

Key objectives of WP11 include:

- Understanding short- and long-term climate risks which could impact facility integrity.
- Providing useful tools to evaluate the impacts of climate change on radioactive waste management facilities across diverse European climate zones.
- Evaluating current regulations to improve climate resilience strategies.
- Studying examples of future climate conditions to enhance safety assessments for long-term radioactive waste containment.

In summary, WP11's expected outcomes include improved safety through better climate impact and risk assessment methodologies, an enhanced understanding of climate change impacts on waste management facilities and a strengthened engagement with civil society and stakeholders to foster confidence in nuclear waste management safety.



Participants to the first WP meeting – Ghent (Belgium) 25 October



(Innovative and new Container/canister Materials under Disposal field conditions)

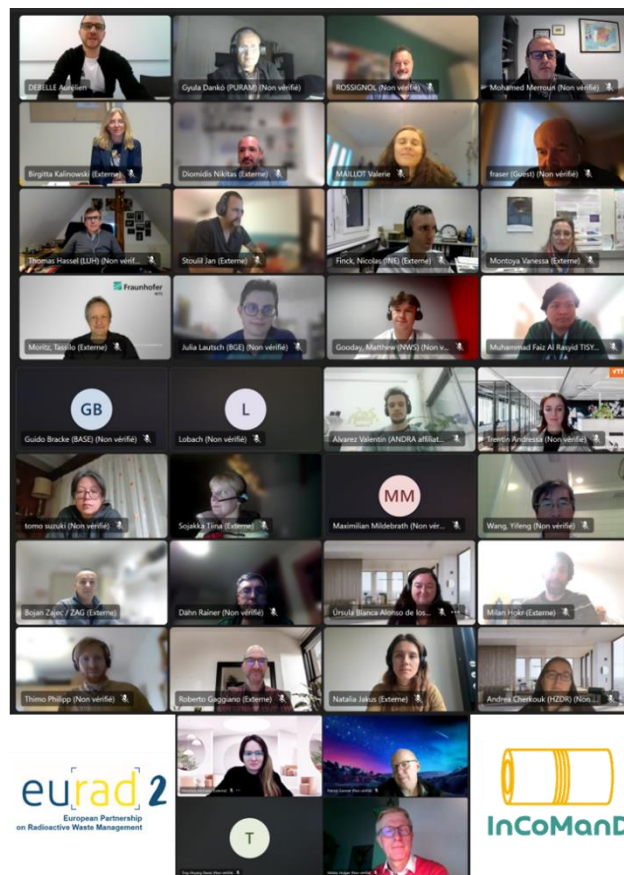
The work-package InCoManD - Innovative and new Container/canister materials under disposal field conditions: Manufacturing feasibility and Durability - has now officially begun. Indeed, the InCoManD kick-off meeting took place online on November 18-19. The two main objectives of this WP, that capitalises on the ConCorD WP (EURAD-1), are:

- (i) to identify innovative material solutions for manufacturing containers for high-heat-generating waste in geological disposal facilities, and
- (ii) to provide a better understanding of more traditional reference materials.

Over 40 fellows attended the meeting, with a peak of 52 participants. All partners had the opportunity to present: the WMOs shared their concepts and expectations for InCoManD, while the other partners showcased their expertise, capabilities, and plans for the first two years of the project.

These presentations, led to many interesting scientific and technical discussions.

The next step is the finalisation, with the help of the Expert Review Group (ERG), of the detailed work plan, which will be presented during the first face-to-face meeting in Paris from January 20-22, 2025.



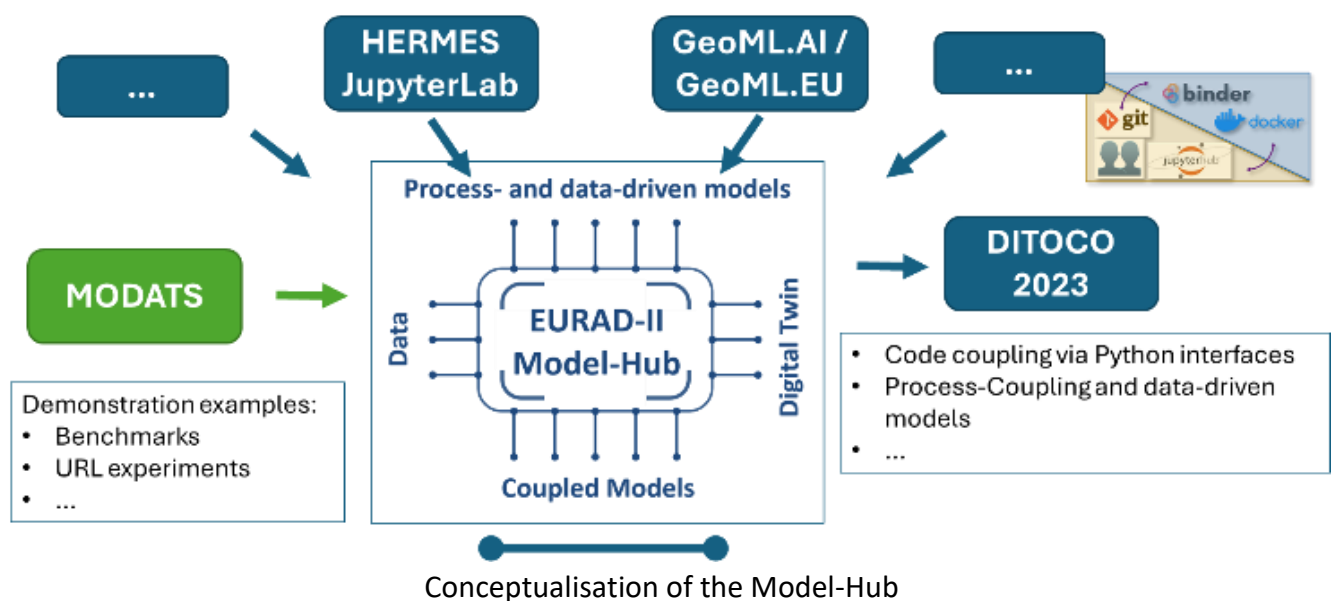
Participants to the first WP meeting – 18-19 November



(High fidelity numerical simulations of strongly coupled processes for repository systems)

Process-based models and simulations are the basis for in-depth system understanding, analysis of experimental observations and upscaling of model parameters from experimental framework to geological timescales. Due to the complexity of the repository system design and the extremely long time-periods involved, modelling is the only way to evaluate the long-term evolution of the repository conditions. Recent developments in the field of data sciences and improvements in computational efficiency of surrogate models executed on modern computer infrastructures open the way for developing efficient coupled numerical models (Digital Twins) for real-time numerical analysis of laboratory and field experiments, repository design, components optimisation and comprehensive safety analyses.

Generally speaking, surrogate models are simplified mathematical approximations of more complex, computationally expensive models describing conservation laws by partial differential equations. Surrogate models are set up based on the input/output data from high-fidelity reference models with the aim to reduce computational costs while providing a sufficiently high accuracy. Particularly promising are machine learning approaches for sub-process simulations in coupled thermo-hydro-mechanical-chemical (THMC) models, data exchange between numerical codes operation at different scales, performance optimised reduction of input data and extraction of constitutive relations from large numerical, experimental and monitoring datasets.



HERMES aims at the development of open-access tools for simulation of strongly coupled THMC Feature, Events and Processes in repository systems (near-field and host rocks). In

addition to improving real-world models in terms of numerical accuracy and computational efficiency, WP-HERMES also focuses on the implementation of application-oriented tools for code validation and model benchmarking as well as engagement of experimental data directly into the digital, web-based workflows. In terms of model benchmarking, HERMES works closely with other national and international projects (e.g., DECOVALEX 2027).

HERMES kick-off meeting took place on November 4-5, at Paul Scherrer Institute in Switzerland. The meeting was focused on the refinement of the collaborative programme and identification of topical research clusters to strengthen the collaborative effort among the partners. One of the core objectives of the project includes the development of the modelling tools, benchmarks, and validation datasets available through a professionally managed Model-Hub supporting collaboration between modelling teams, providing an interface with experimental studies, and making the knowledge from the HERMES work package available to the broader scientific community.



Participants to the first WP meeting – PSI offices (Switzerland), 4-5 November

STREAM (Sustainable TREATment and iMMobilisation of challenging waste)

STREAM is dedicated to exploring innovative and sustainable solutions for the treatment and conditioning of challenging wastes, such as, reactive metals, liquid or solid organic waste, incineration ashes and sludges.



Participants to the first WP meeting – 6 November

STREAM gathers 24 organisations from 13 countries, including research entities, technical safety organisation and waste management organisations. The partners involved in this Work Package have valuable expertise in treatment and conditioning methods and relevant capacity to identify good practices in waste conditioning, develop new waste management routes and conditioning methods in a safe and sustainable way, and demonstrate the upscaling feasibility.

On November 6th, the kick-off meeting was conducted online, with 48 participants representing 84% of the partners involved in the WP. The main objectives were to provide an overview of the expected outcomes by the end of the project, to introduce the task leaders involved and present the scope of their tasks over the next five years, and to present the team members from all the organisations participating in STREAM.

Over the first six months of the project, the efforts of the WP will mainly be focused on Task 2: Knowledge management, which is being led by CIEMAT. The main objective of this task is to capture knowledge about the treatment and conditioning processes under development for the challenging wastes to be studied in STREAM, and their needs for optimisation to facilitate their scale up and industrial implementation. This information will be compiled in the first deliverable of WP6, titled “D6.1 State of art report (Initial)”. In this first 6 months, Task 2 is working in close collaboration with Task3: Study of treatment and conditioning methods led by CSIC in order to define the most relevant requirements that the waste treatments and conditioning matrices should meet for an optimal waste-stream immobilisation and the needs of improvement of new conditioning matrices under development.

CSFD (Criticality Safety for Final Disposal)

Ensuring criticality safety of final disposal facilities requires developing, optimising and implementing dedicated technical and administrative measures. The effectiveness and impact of these measures are evaluated in the criticality safety case of the disposal facility. For geological disposal concepts, the criticality safety assessments are carried out for time scales, which are typically orders of magnitude larger than in any other area of the fuel cycle. Understanding, modelling and assessing the potential evolution of fissile waste packages over such long timescales represent a challenge that requires substantial new research, although there is a good knowledge base on which to build.

The results and conclusions of this research will be used to support optimisation of aspects of waste packaging and disposal concepts. While certain aspects of a post-closure criticality safety (PCCS) assessment are intrinsically related to the particularities of each individual disposal concept, leading to differences in the way organisations derive and present PCCS arguments and address optimisation, many organisations face similar challenges. The research leading to advanced and innovative PCCS assessment methods will bring broad benefits to all project participants and their national programmes through activities focusing on:



Presentation of the CSFD WP by Efstathios Vlassopoulos (NAGRA) – EURAD-2 Kick-off meeting October 2024

- Validation of long-term evolution scenarios for PCCS assessments;
- Verification of calculation model implementation for PCCS assessments;
- Validation of depletion and criticality codes for PCCS assessments;
- Methodologies for post-closure criticality consequences assessments;
- Fissile waste package records as evidence supporting PCCS assessment assumptions;
- PCCS communication techniques.



(Hydraulic mechanical chemical evolution of bentonite for barriers optimisation)

The Hydraulic mechanical chemical evolution of bentonite for barriers optimisation (ANCHORS) work package, led by the Institut de Radioprotection et de Sûreté Nucléaire (IRSN) aim to increase the optimisation potential of bentonite barrier systems: buffer, backfill and seals, performance assessment and the safety case resilience 1) by qualifying the HM behaviour of various kind of bentonite types and mixtures through laboratory experimental programme focused on heterogeneity and chemical effects at different scales, 2) by improving the numerical tools that are necessary to carry out performance assessment of bentonite barriers in a THMC(G) repository environment.



ANCHORS – Kickoff meeting (14 & 15 November, 2024) in Fontenay-aux-Roses, France

Over a five-year period, thirty-one partners and eleven associated partners from fifteen countries are collaborating across four key tasks, encompassing knowledge management and training, experimental research, and advanced modeling. The laboratory testing task focuses on multiscale experimental characterization of various bentonite types and mixtures, with emphasis on chemical loadings, heterogeneity, friction, and mixture optimization. This task also includes the analysis of aged bentonites obtained from in situ tests. The modeling task centers on enhancing constitutive models and numerical tools for assessing the performance of bentonite barriers, with a specific focus on the effects of temperature, heterogeneity and chemical interactions. Furthermore, it aims to build confidence in safety case applications by addressing parameter sensitivity, long-term evolution, and uncertainty propagation in large-scale bentonite barrier systems. ANCHORS involves the establishment of a comprehensive database containing THMC material properties and representative numerical results for various kinds of bentonites and mixtures, along with quality control recommendations for improving the performance and reliability of bentonite as a sealing material.

OPTI (High-level waste repository optimisation including closure)

The Strategic Study “HLW Repository optimisation including closure (OPTI)” is motivated by the fact that the first High-level waste (HLW)/Spent nuclear fuel repository projects are entering the construction and operation phases and that optimisation is becoming increasingly important. Furthermore, the discussion of optimisation is justified by the long-term nature of repository projects in general. Within each project, changing boundary conditions (e.g. new waste types), technological developments, or the process adaptations based on operational experience will justify and require optimisation. Further, optimisation is a process that shall involve all stakeholders of a RWM programme, civil society included. Thus, the objectives of WP OPTI are to develop a mutual understanding and provide recommendations about methodologies and further activities for design and optimization of specific HLW deep geological repository systems, structures and components (SSCs) and procedures. This includes the identification of the main drivers for optimization as well as potential different views and priorities of the stakeholders. Other important questions are e.g. At what point in the programme is optimisation needed, recommended or forbidden? What main key challenges are seen for optimisation?

The outcome of the WP will be the documentation of the actors views, as well as the identification of key challenges including future activities related to the optimisation of repositories. Further, an overview of approaches to and related optimisation strategies for specific Engineered Barrier Systems components and Deep Geological Repositories processes will be given. Possible optimisation of options/plans related to closure processes (possible closure criteria/acceptability criteria...). Discussing these questions creates a platform for waste management organisations, technical safety organisations, and research entities as well as the interested civil society to share best practice for optimisation strategies and processes. The results will notably help both advanced and less advanced programmes. Knowledge transfer from advanced to less developed programmes will be facilitated.



Participants to the first WP meeting – Hannover (Germany), 28 November



(Alternative waste management strategies)

ASTRA is a Strategic Study connected to outcomes and recommendations of the EURAD-1 work package ROUTES. It aims to analyse the readiness, feasibility and challenges of alternative radioactive waste management solutions needed by many countries, in particular small inventory countries, but also larger programmes, for implementation as part of national waste management strategies. The outcomes of the work package will inform optimisation of Member States' waste management programmes, including development of tailored solutions informed by best practices deployed elsewhere, and facilitate structured interactions to help foster mutual understanding and trust.

- Tasks 1 and 2 take care of management and knowledge management as was defined for the whole EURAD-2.
- Task 3 considers the design lifetime of waste containers and/or storage facilities exceeding the design life-time prior to disposal. In Task 3 the potential environmental impacts, potential hazards, and waste extraction or retrieval options are assessed and the required financial resources and technology availability are considered.
- Task 4 evaluates deep borehole disposals as a potential alternative disposal route to mined repositories for higher activity radioactive wastes, with the aim of considering technology readiness and viability and its possible role in the disposal programmes of both small and large inventory member states.
- Task 5 analyses management strategies for small amounts of diverse and challenging wastes. Disposal strategies for specific challenging wastes (waste containing naturally occurring long-lived radionuclides) are elaborated, and shared solutions for different radioactive waste are assessed, including predisposal activities and disposal facilities, considering long-term strategic issues.
- Task 6 enables interactions between technical partners of ASTRA and civil society participants in EURAD-2. The interactions will include a close collaboration of civil society experts directly inside Tasks 3, 4, and 5, as well as a workshop at the end of ASTRA using methods developed in EURAD-1.

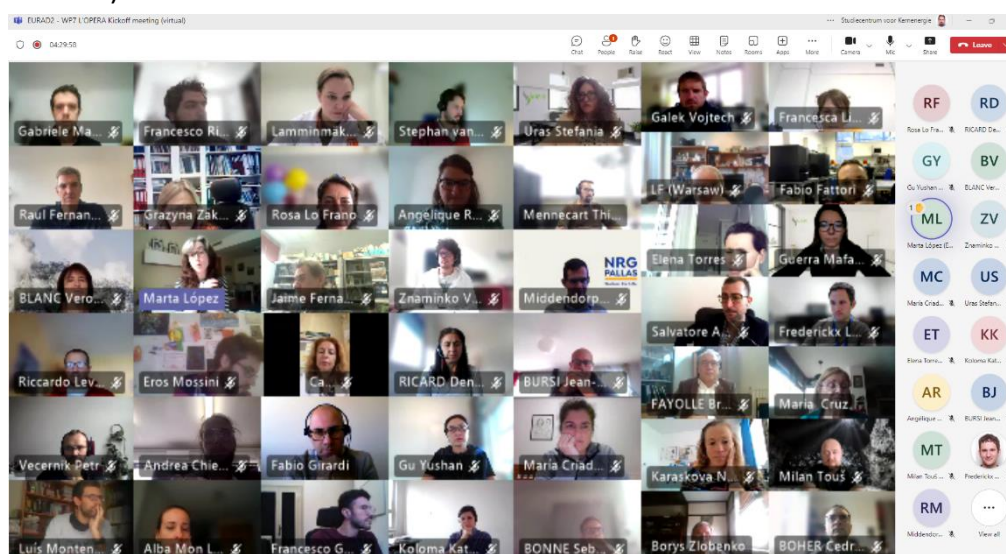
ASTRA had an online kick-off on 29.10.2024, but already week before that, at EURAD-2 kick-off in Ghent, some of the partners had an opportunity to meet up briefly (picture).



L'OPERA (Long Term Performance of waste matrices)

In many (European) countries, waste producers and waste management organisations need to manage a wide variety of radioactive waste streams coming from different nuclear sectors (e.g., nuclear power plants, medical applications, research activities, etc.). Focusing on the low- and intermediate-level radioactive wastes (LL-ILW), the work package L'OPERA aims to expand the base of knowledge and understanding on the durability of innovative matrices under representative disposal conditions, in particular geopolymer, magnesium potassium phosphate cement, nochar and alkali-activated materials, which are considered as possible alternatives of traditional matrices such as cement-based materials. Initiated in previous European projects (e.g., PREDIS, THERAMIN), immobilisation of radioactive liquid and solid organic wastes or reactive metals have been investigated. L'OPERA will provide useful information about the long-term performance of these innovative matrices, allowing an increase of the Technology Readiness Level of the selected processes, and to define the most suitable routes for the long-term management of LL-ILW.

Led by SCK CEN and involving 28 organisations from 11 countries, the work package is divided into several tasks. VTT is currently gathering information to define the expected boundary conditions prevailing in disposal facilities to define experimental protocols and procedures. These reference documents will be used in the task devoted to durability and stability testing of waste forms, led by ANDRA. A complete and descriptive inventory of the materials investigated in L'OPERA was initiated by CIEMAT. This inventory includes detailed information about the formulations, physical and chemical composition of the materials and will be completed throughout the program with data from performance evaluation tests. Finally, UniPi will coordinate the modelling activity aimed to predict the long-term behaviour of the reconditioned matrices. A considerable amount of information and data will be made available during the programme, and SOGIN is in charge of the knowledge management activities, starting with the production of the initial state of the art, which will be updated at the end of the programme. L'OPERA will closely collaborate with the work package WP6-STREAM, including the delivery of different materials for durability tests, and will also benefit from other work packages activities focused on LL-ILW management (e.g., WP3-ASTRA, WP5-ICARUS, or WP14-SUDOKU).



FORSAFF (Waste Management for SMRs and Future Fuels)

While there are numerous SMR designs being developed globally, questions remain as to how the back end of the fuel cycle will be handled. The wide variety of fuel types and characteristics may prove challenging in assessing treatment options and waste form disposability. The primary aim of FORSAFF is to identify knowledge gaps and provide recommendations for future research regarding SMR waste generation and waste management.

FORSAFF will evaluate SMR waste inventories, including those related to the back end of the fuel cycle, and their main physico-chemical-radiological properties, and assess predisposal (treatment, conditioning, storage, transport) approaches and development needs in terms of anticipated waste generation across several reactor designs and operating conditions. Disposal routes for SMR wastes over a range of needs will be reviewed, considering both conventional as well as more recent concepts. Finally, national policies and regulatory frameworks in the context of SMR fuel cycle and waste management will be examined as will stakeholder perceptions and concerns.

FORSAFF will deliver a Green Paper by October 2025 providing guidance on SMR implementation and deployment needs from the back end of the fuel cycle perspective and a White Paper by March 2026 identifying knowledge gaps for future R&D activities. By integrating technical, regulatory and stakeholder perspectives, FORSAFF intends to provide beneficial recommendations for the management of nuclear waste from SMRs, thereby supporting their broad deployment.



FORSAFF Management Team at the EURAD-2 kick-off meeting in Ghent, Belgium

SUDOKU (Near surface disposal optimisation based on knowledge and understanding)

A consortium of experts from 29 European institutions will jointly perform laboratory experiments and in situ tests, complemented by modelling studies to deepen the current understanding of the behaviour and performances of multilayer covers and cementitious barriers in near-surface disposal facilities. The combination of on-site and laboratory studies with state-of-the-art numerical models will ensure the necessary reliability of the results and facilitate the elaboration of recommendations for optimal EBS design from the safety point of view.

The investigations performed on multilayer covers will be combined with durability studies of cementitious barriers to assess the transport properties of mobile radionuclides (such as C-14, Cl-36, I-129, Tc-99) in damaged cementitious barriers according to their chemo-mechanical evolution.

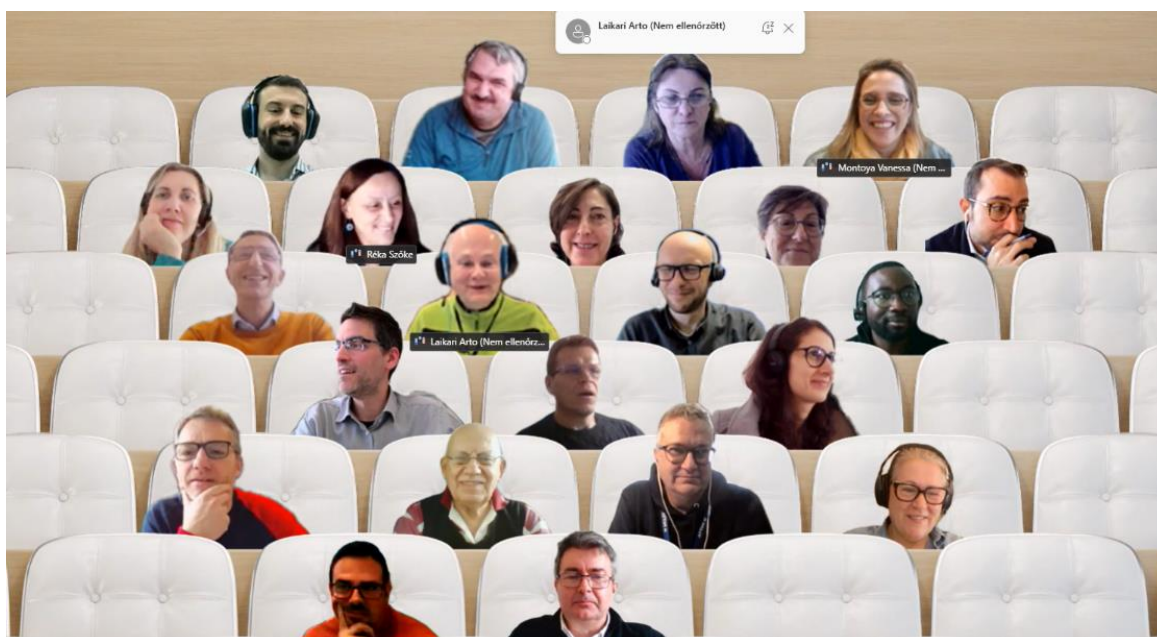
The work programme in SUDOKU is organized in three technical tasks: (i) performance of multilayer covers (Task 3), (ii) chemo-mechanical evolution of reinforced and unreinforced cementitious barriers and the effect on the migration of mobile radionuclides (Task 4), and (iii) modelling the evolution of the engineered barrier system (EBS) and its consequence for radionuclide migration based of the experimental results obtained in SUDOKU (Task 5). These tasks are complemented by a task dedicated to knowledge management (Task 2) aiming to capture knowledge relevant for SUDOKU and to contribute to knowledge transfer to the EURAD-2 community and beyond through the EURAD-2 KM programme.



Multilayer cover – El Cabril, Spain

DITOCO2030 (Next generation Digital Twins to support Optimisation, Construction and Operation of surface and subsurface RWM facilities)

The nuclear sector is on the brink of adopting cutting-edge technologies that are critical for enhancing safety and addressing societal challenges. Cross-industrial collaboration on next-generation Digital Twins (DT) holds the potential to bring significant advancements in innovation, safety, and efficiency in the nuclear sector.



Participants to DITOCO2030 kick-off meeting

The vision of DITOCO2030 is to create a shared understanding of the specific requirements from various disciplines within a Digital Twin framework. Its primary objective is to pave the way for closing the R&D gap between the currently fragmented DT of individual disciplines, common data environments, and decision-making platforms in the field of the radioactive waste management. This will enable a clearer understanding of the opportunities and limitations of DT, as they are applied across the entire lifecycle of radioactive waste management. The strategic study will deliver high-level outcomes that will benefit all three identified EURAD Strategic Research Agenda drivers: Implementation Safety, Scientific Insight, and Knowledge Management.

DITOCO brings together 27 partners from 15 countries, including Waste Management Organisations, Research Entities, and Technical Safety Organisations. This diverse group of Partners will address the technical challenges of DT integration, pooling expertise from various fields such as waste management, engineering, geology, operations etc. The initiative will also gain from cross-industry collaboration, drawing on insights and experiences from other sectors to facilitate the successful implementation of this technology within our own industry.

Stakeholder engagement is a core focus of the DITOCO2030 work package: the organized workshops will facilitate information exchange and knowledge transfer and ensure that stakeholder feedback is integrated. This aims to help guide the development of DT, ensuring it meets the needs of both the nuclear sector and broader industries.

Looking Ahead

With strong international collaboration and a diverse group of partners, DITOCO2030 is poised to make significant steps in the development and deployment of DT in nuclear waste management. The project is a vital step toward realising the full potential of the technology, offering new opportunities for improving safety, efficiency, and decision-making across the entire waste management lifecycle.

Stay tuned for updates and be part of this exciting journey toward innovation in nuclear waste management by becoming our Stakeholder or End-User.



Missing WP ?

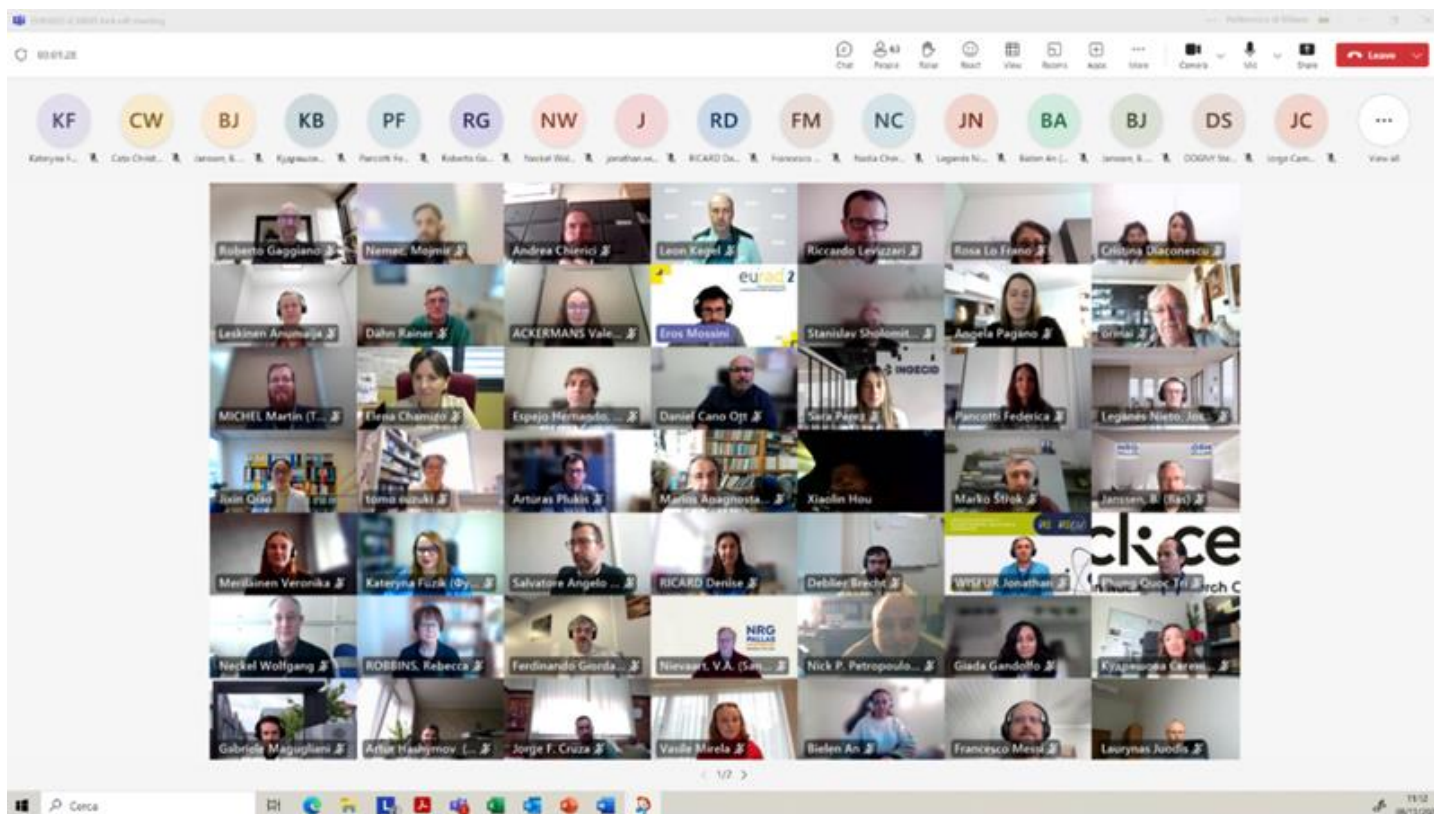
We did not forget RAMPEC WP about Radionuclide mobility under perturbed conditions – stay tuned for EURAD-2 second newsletter to learn more about this work package !

ICARUS (Innovative characterisation techniques for large volumes)

ICARUS aims at further developing, optimising and harmonizing innovative techniques for the characterization of radiological, physical and chemical properties of LLW/ILW-mixed waste which could be critical for the safe implementation of radioactive waste management programmes.

Based on state-of-the-art techniques and industrial needs, ICARUS will focus on 4 primary use cases:

1. innovation and optimization of Non-Destructive Techniques (NDT) – both in-situ and remote gamma and neutron analyses – for fast and sufficiently accurate radiological characterization of complex large packages for industrial applications (decommissioning);
2. optimization and simplification of NDT for physical-chemical characterisation of waste to support expensive Destructive Techniques (DT) and high uncertainty Scaling Factors (SF) methods in relevant industrial scenarios of radioactive waste pre-disposal management;
3. improvement of sensitivity, accuracy, uncertainty and reduction of cost and efforts of conventional DT for comprehensive radiological characterization of radioactive waste towards Difficult-To-Measure (DTM) radionuclides for which limitations/difficulties remain (e.g. C-14, Cl-36, Ca-41, Se-79, Zr-93, Mo-93, Tc-99, Pd-107, Cs-135, Cm-243, Cm-244);
4. improvement of accuracy, uncertainty, reliability and validation of SF methodology for comprehensive radiological characterization of DTM radionuclides in radioactive raw mixed waste to meet ever stringent requirements set by national regulators.



SAREC (Release of safety relevant radionuclides from spent nuclear fuel under deep geological conditions)

The kick-off for SAREC took place in Ghent on the 22nd of October. The meeting was short and efficient, only two hours, and 24 people from the majority of the 26 partner organisations. A social dinner was also arranged in the evening (picture).

SAREC is the acronym for “Release of safety relevant radionuclides from spent nuclear fuel under deep disposal conditions”, an R&D WP within the EURAD-2 Partnership. The kick-off meeting started with an overview, highlighting the background and objectives to the planned research work. This WP focuses on radionuclide release from spent nuclear fuel, in particular the relation between measured fission gas release and the fraction of certain mobile radionuclides that are released quickly at water contact in geological repositories.

After the background and objectives, the six different tasks were presented: 1) Management and coordination 2) Knowledge management 3) IRF/FGR Performance of Spent Nuclear Fuel 4) Role of Grain Boundaries in Spent Fuel Corrosion 5) Studies on Model Materials, and 6) Mechanistic modelling. Some time was spent on focusing on the upcoming deliverables and workshops, and finally some tips and advice were provided by representative of the Programme Management Office. We then enjoyed a dinner together and are all looking forward to interesting and valuable collaboration during the coming five years!



WP Sarec kick-off participants at the dinner in the Marriot hotel, Ghent.

Knowledge Management

Knowledge Management (KM) plays a vital role in EURAD-2, ensuring the knowledge produced within the European partnership on radioactive waste management is sustainable, accessible, and useful for decades to come. Building on the achievements and lessons learnt from EURAD(-1) and PREDIS, the KM work package focuses on implementing the SRA through strengthening competences and complementing national and international efforts, such as those of the IAEA and NEA. With a vision spanning the next 10 to 20 years, EURAD-2 KM is all about making sure knowledge is preserved and shared effectively.

On November 6, 2024, the KM Kick-Off Meeting brought together 37 participants, including KM board members, Knowledge Ambassadors/Task 2 leaders, and members of the KM work package. The meeting set the stage for the programme's goals: achieving long-term sustainability, competence building, and aligning efforts with ongoing initiatives. Participants were introduced to the KM structure and tasks, i.e., knowledge capture (Task 2), knowledge application and know-how development (Task 3), competence building (Task 4), and KM programme tools and methods (Task 5). Dr. Alexandru Tatomir (BGE) was welcomed as the new KM WP leader and the meeting provided the opportunity for everyone to get to know each other and align on roles, expectations and priorities, laying a strong foundation for what's to come.



1KM Board meeting at EURAD-2 Kick-Off in Ghent

A follow-up meeting with Knowledge Ambassadors, held on November 20, focussed on their essential contributions, particularly for the upcoming green and white papers (from Strategic Studies) and State-of-the-Art reports (from RD&D work packages). Work has already begun on gathering input for these deliverables, ensuring a coordinated approach. The next steps involve the preparation of another meeting for January with Knowledge Ambassadors focusing on the production of Knowledge transfer documents (Domain Insights, State-of-Knowledge documents and targeted guidance), conducting training, and shaping the Data Management Plan. KM is now embedded in every single work package, and its impact is already being strongly felt. The KM Board plans that the guidance on the Mobility application platform and Data Management Plan will be available in the next months, as well as the first plans for year 1 training activities. We hope that industrial End Users having an interest in KM activities will also register to follow and be involved in guiding this work package



Now published

All presentations given during the kick-off meeting are now available on EURAD-2 website: [Link](#)

The FAQ has been updated in November and is accessible on EURAD-2 website: [Link](#)

Recording of the EURAD-2 introductory webinar is available on EURAD-2 website: [Link](#)



SAVE THE DATE: EURAD-2 First annual event



Monday 8 to Friday 12 September 2025



Bologna, Italy



Official registration opens early 2025 - stay tuned for more details!





Upcoming events

JANUARY

20-22: InCoManD WP kick-off (Paris, France) – invitation only

FEBRUARY

4-5: SUDOKU WP Meeting (Madrid, Spain) – invitation only

MARCH

09-13: [WM Symposia](#) (Phoenix, USA)

MAY

12-16: [FISA-EURADWASTE & SNETP FORUM](#) (Warsaw, Poland)



Call for contributions

SAFEND2025: Interdisciplinary Research Symposium on the Safety of Nuclear Disposal Practices – [Link](#)

Call open from 17/12/2024 to 11/03/2025

ANS IHLRWM Conference: American Nuclear Society International High-level radioactive waste management Conference

Deadline 24/06/2025



We are out there



Vous avez reposté

Rosalinde van der Vlies @RosalindeEU · 17 oct.

Happy to kick-off a key event with the @EU_EESC on ensuring that #research in #radioactive #wastemanagement is shaped by both #scienceexcellence & strong #public #Engagement. Food for thoughts for our new partnership – #eurad 2 – soon to start.

EESC Energy, Transport & Digital @EESC_TEN · 17 oct.

"Decisions for future generations shouldn't be left solely to scientists. Engaging #CivilSociety in our Partnership on #RadioactiveWasteManagement is essential", says @RosalindeEU, Clean Planet Director at @EUScienceInnov in @EU_Commission

Voir plus

Réka Szöke · 1er

Principal Scientist in Nuclear | Materials Science | Tech. Coordinator for Eurato...
3 sem. • Modifié

I recently attended the EURAD-2 kickoff meeting in Ghent, where I had the opportunity to present the #DITOCO2030 strategic study, focusing on next-generation #DigitalTwins to support the optimization, construction, and operation of surface and subsurface radioactive waste management facilities. ✨ Yet, it wasn't all work; we also enjoyed moments of laughter, caught up with colleagues, and shared warm hugs with friends. It was a wonderful way to launch our new collaboration, and I eagerly anticipate the exciting journey ahead!

#Euratom Institute for Energy Technology EURAD-2 #collaboration #digitaltwins #wastemanagement DigiDECOM Community

Afficher la traduction



Efstathios (Stathis) Vlassopoulos · 2e

Lead High-Level-Waste Disposal Programme Optimization at Nagra
3 sem. •

Last week marked the kick-off of the EURAD-2 project in Ghent, Belgium!

Nagra - Nationale Genossenschaft für die Lagerung radioaktiver Abfälle is actively engaged across multiple Work Packages (WPs), proudly leading WP17, which focuses on criticality safety in final disposal.

I had the pleasure of participating and presenting WP17's structure and objectives on behalf of my colleague Madalina Wittel.

This is just the beginning of an exciting 5-year journey, and I'm looking forward to the impactful research and valuable collaborations that lie ahead! 📄🔧

Afficher la traduction



David García Cobos · 1er

Head of Department / Director de Departamento en Amphos 21 Consulting SL
3 sem. •

Finishing the week in Ghent, where Amphos 21 RSK Group representatives are attending the Kick-Off meeting of the #EURAD-2 European Commission project (<https://www.ejp-eurad.eu>) funded by #EURATOM. ... plus

Afficher la traduction



Vous et 56 autres personnes

1 commentaire • 5 republications