

KNOWLEDGE MANAGEMENT IN EURAD

Importance of knowledge and KM in daily life of implementing RWM activities

Niels Belmans (SCK CEN Academy, WP13 Lead)
on behalf of EURAD WP11, WP12 and WP13



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EURAD KNOWLEDGE MANAGEMENT & NETWORKING PROGRAMME

IAEA defines knowledge management (KM) as:

*“an integrated, systematic approach to identifying, acquiring, transforming, developing, disseminating, using, sharing and preserving knowledge, relevant to achieving specified objectives”**

*: Karseka and Yanev, IAEA, 2013

EURAD KNOWLEDGE MANAGEMENT & NETWORKING PROGRAMME

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→ “Enhance knowledge management and transfer” is one of EURAD’s main objectives

→ EURAD Knowledge Management & Networking Programme

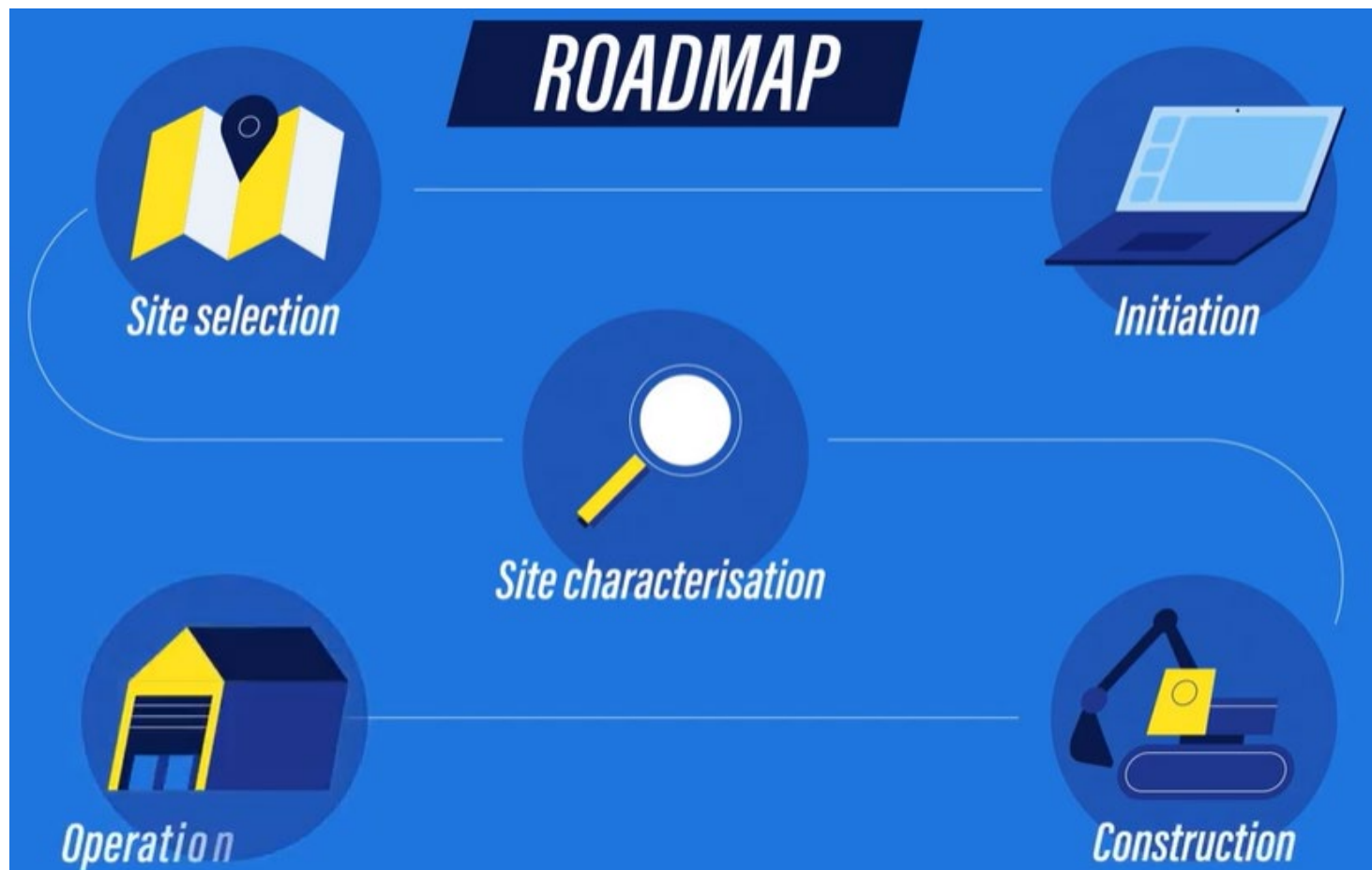
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EURAD KNOWLEDGE MANAGEMENT & NETWORKING PROGRAMME

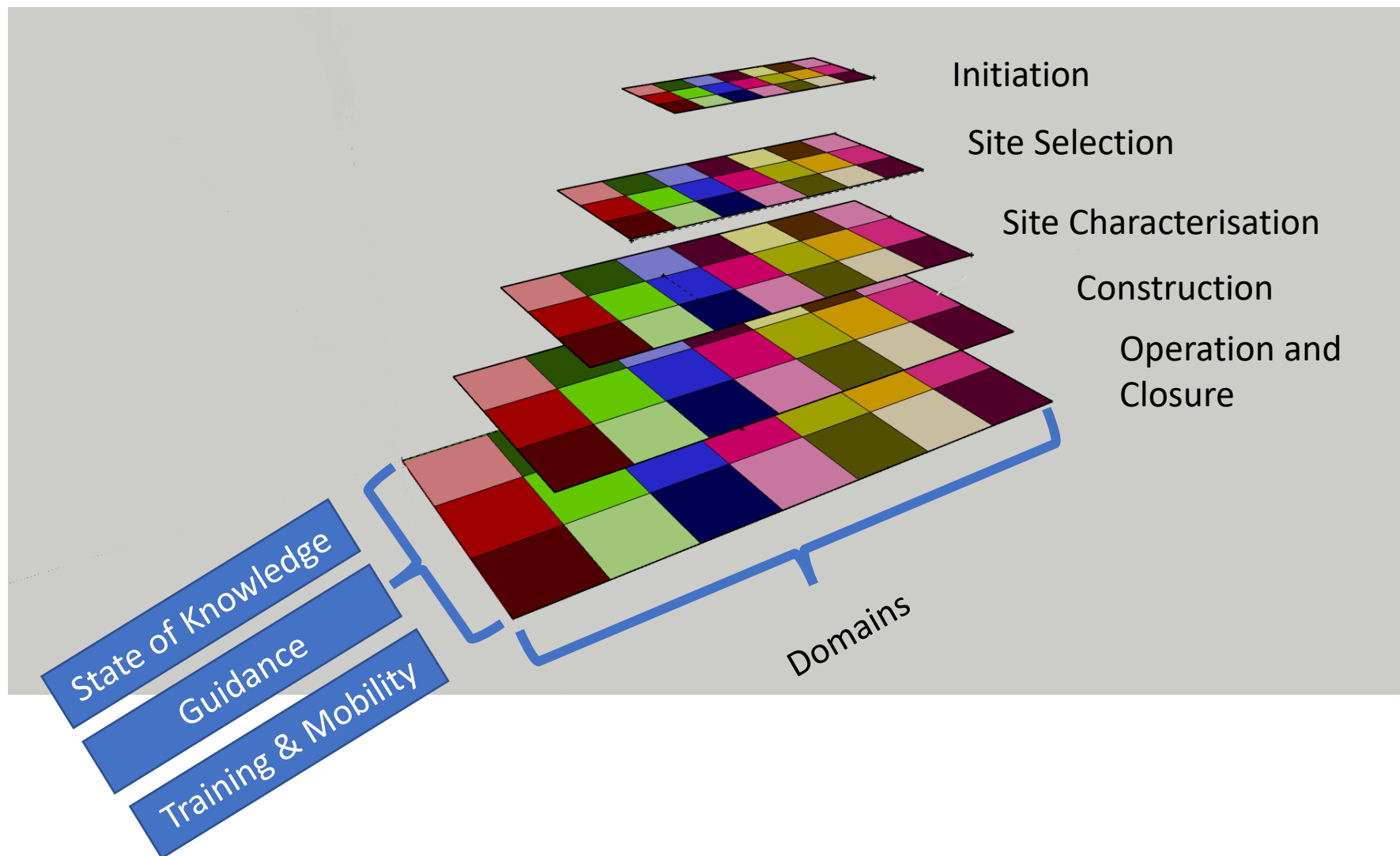
- 1 Roadmap
A common framework to structure knowledge
- 2 State of Knowledge
What we know and why its important
- 3 Guidance
Best practice and lessons learned
- 4 Training & Mobility
Nuclear experience and know-how
- 5 Networking & Tools
Connecting people to people, and people to content



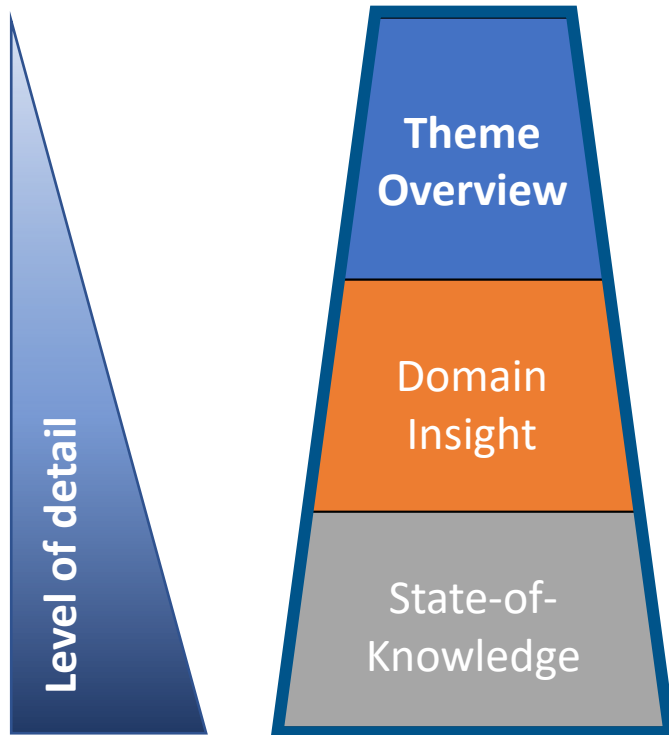
ROADMAP AND KM



ROADMAP AND KM



WP11 STATE OF KNOWLEDGE - THE DOCUMENT STRUCTURE



Theme Overview

Broad description of programme goals and typical activities for each theme and how they evolve over the phases of implementation

Domain Insight

Context documents that provide direct links for each knowledge domain to safety and implementation goals related to DGR requirements

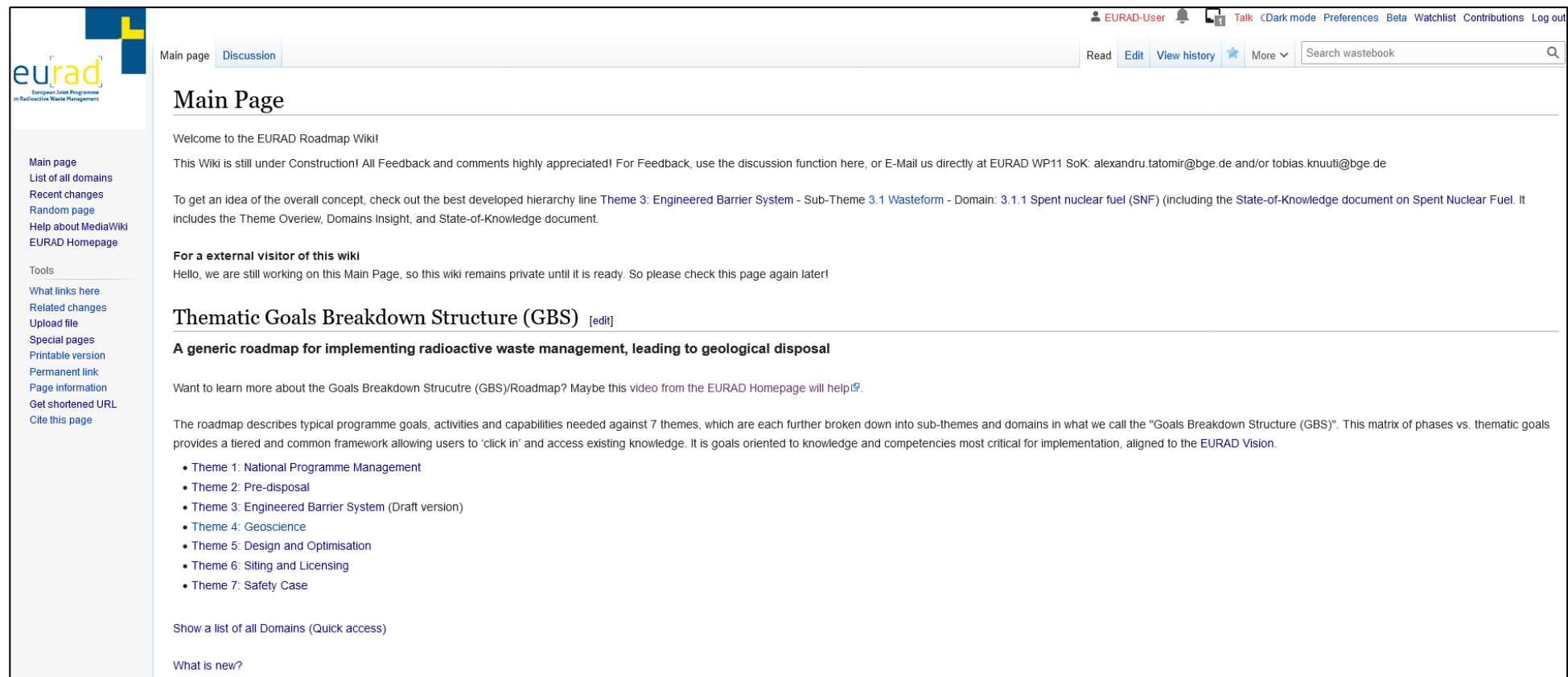
State-of-Knowledge

Experts' view of the most relevant knowledge and associated uncertainties in a specific domain applied in the context of a radioactive waste management programme

WP11 STATE OF KNOWLEDGE – MAKING KNOWLEDGE AVAILABLE

- It is not enough to just create documents, they need to be available and discussed

→ One way to share is through the EURAD Wiki



The screenshot displays the EURAD Wiki Main Page. At the top, a navigation bar includes links for 'Main page', 'Discussion', 'Read', 'Edit', 'View history', 'More', and a search bar labeled 'Search wastebok'. The left sidebar contains a list of links: 'Main page', 'List of all domains', 'Recent changes', 'Random page', 'Help about MediaWiki', 'EURAD Homepage', 'Tools', 'What links here', 'Related changes', 'Upload file', 'Special pages', 'Printable version', 'Permanent link', 'Page information', 'Get shortened URL', and 'Cite this page'. The main content area is titled 'Main Page' and contains a welcome message, a notice about the wiki's construction status, and a list of links to various themes and domains. Below this, a section titled 'Thematic Goals Breakdown Structure (GBS)' is shown, followed by a list of themes and a link to a video from the EURAD Homepage.

EURAD-User

Talk Dark mode Preferences Beta Watchlist Contributions Log out

Main page Discussion

Read Edit View history More Search wastebok

Main Page

Welcome to the EURAD Roadmap Wiki!

This Wiki is still under Construction! All Feedback and comments highly appreciated! For Feedback, use the discussion function here, or E-Mail us directly at EURAD WP11 SoK: alexandru.tatomir@bge.de and/or tobias.knuuti@bge.de

To get an idea of the overall concept, check out the best developed hierarchy line [Theme 3: Engineered Barrier System](#) - Sub-Theme [3.1 Wasteform](#) - Domain: [3.1.1 Spent nuclear fuel \(SNF\)](#) (including the [State-of-Knowledge document on Spent Nuclear Fuel](#). It includes the Theme Overview, Domains Insight, and State-of-Knowledge document.

For a external visitor of this wiki

Hello, we are still working on this Main Page, so this wiki remains private until it is ready. So please check this page again later!

Thematic Goals Breakdown Structure (GBS) [\[edit\]](#)

A generic roadmap for implementing radioactive waste management, leading to geological disposal

Want to learn more about the Goals Breakdown Strcutre (GBS)/Roadmap? Maybe this video from the EURAD Homepage will help [📺](#).

The roadmap describes typical programme goals, activities and capabilities needed against 7 themes, which are each further broken down into sub-themes and domains in what we call the "Goals Breakdown Structure (GBS)". This matrix of phases vs. thematic goals provides a tiered and common framework allowing users to 'click in' and access existing knowledge. It is goals oriented to knowledge and competencies most critical for implementation, aligned to the [EURAD Vision](#).

- Theme 1: National Programme Management
- Theme 2: Pre-disposal
- Theme 3: Engineered Barrier System (Draft version)
- Theme 4: Geoscience
- Theme 5: Design and Optimisation
- Theme 6: Siting and Licensing
- Theme 7: Safety Case

Show a list of all Domains (Quick access)

What is new?



WP12 GUIDANCE - OBJECTIVES

- **To facilitate orientation in**
 - the field itself;
 - existing knowledge resources;
 - existing international cooperation and networking
- **To facilitate understanding different solutions in different cases and countries.**



WP12 GUIDANCE – SET UP

- **Expected End user groups:**
 - expert in early-stage programs,
 - Young experts and beginners in all programs,
 - key decision makers and stakeholders
- **Relevant Guidance could be developed only on mature topics**
- **Need for transparent process of topics selection.**



OBJECTIVES AND SET UP

- The School of RWM:
 - Act as **coordinating structure** for all training activities
 - Pay attention to the **best-fitted training format**
 - Guarantee **scientific state-of-the-art** (by enlisting subject matter experts as lecturers)
- End-users are
 - Professionals
 - Students
 - Next generation of experts
- Training portfolio linked to EURAD **Roadmap** and referenced in SoK documents
- Mobility
- No registration fee

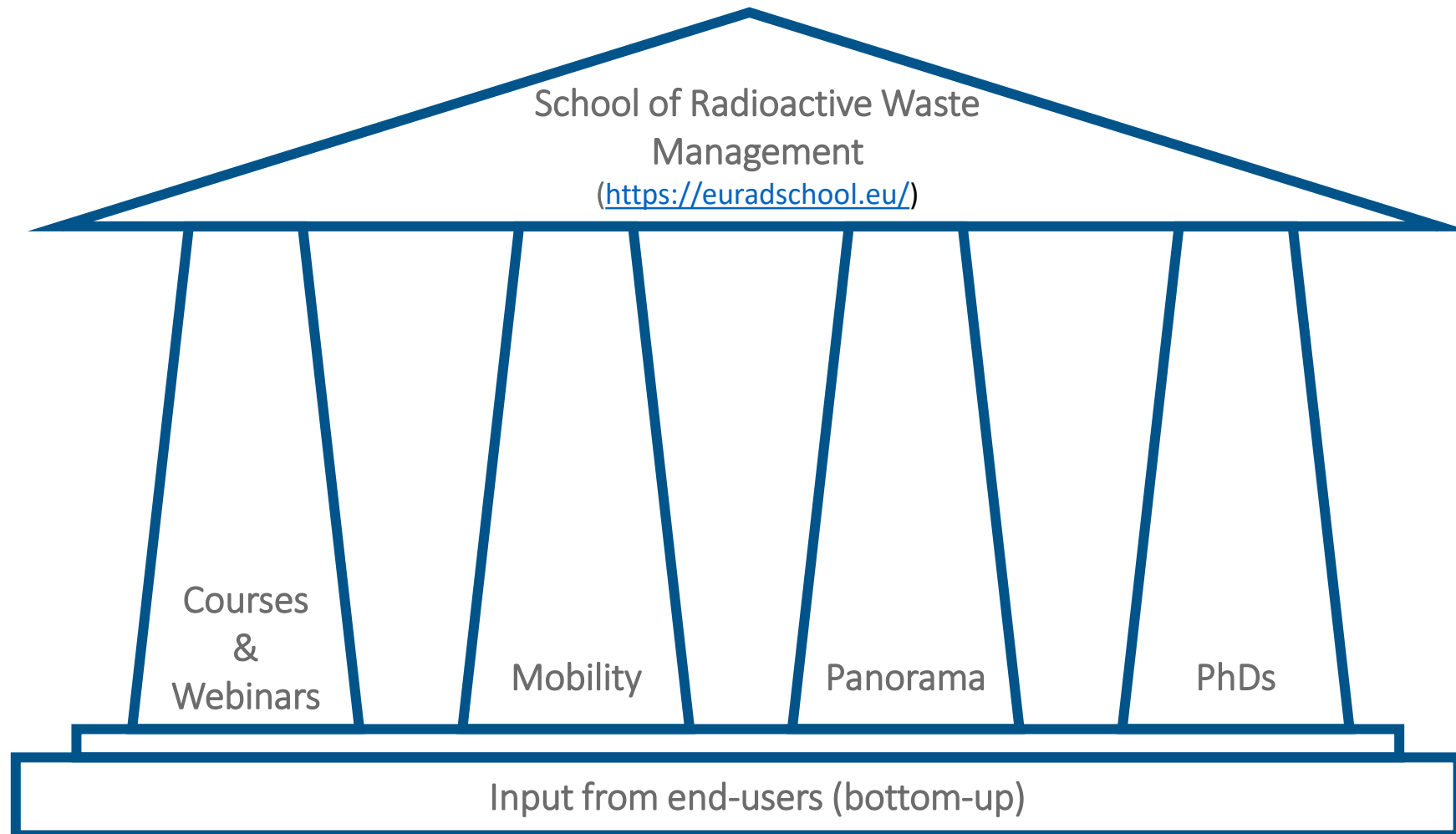
THE EURAD SCHOOL OF RADIOACTIVE WASTE MANAGEMENT

- The School of Radioactive Waste Management (RWM) aims to assist end-users in:
 - *“an integrated, systematic approach to identifying, **acquiring**, transforming, **developing**, **disseminating**, using, **sharing and preserving knowledge (and skills)**, relevant to achieving specified objectives”*

THE EURAD SCHOOL OF RADIOACTIVE WASTE MANAGEMENT

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 - *“an integrated, systematic approach to identifying, **acquiring**, transforming, **developing**, **disseminating**, **using**, **sharing and preserving knowledge (and skills)**, relevant to achieving specified objectives”*
- To this end, the School supports competence (= knowledge, skills and attitudes) building through:
 - Creating a portfolio of needs-driven (existing and newly developed) training courses
 - Organisation of webinars on broad and specific topics by subject-matter experts
 - Hosting a dedicated Mobility Programme
 - Supporting the EURAD PhD community
 - ➔ Providing a panoramic view of all aspects involved in radioactive waste management
- ➔ Centralized on a dedicated website: <https://euradschool.eu/>

THE EURAD SCHOOL OF RADIOACTIVE WASTE MANAGEMENT



WP13 TRAINING – OBJECTIVES

- All new training courses are **needs-driven**
 - **End-user feedback** was gathered in 2020: 80 respondents
 - **Training needs** were identified
- Over 150 **existing courses** identified (September 2021)
- **A training gap analysis** was performed
 - E.g. uncertainty management in radioactive waste management
- All new training courses are **quality-driven**
 - Quality criteria based on **IAEA's Systematic Approach to Training** developed in EURAD
 - ➔ Ensure uniform quality in training courses

WP13 MOBILITY – OBJECTIVES

- The EURAD Mobility Programme financially supports:
 - Performing **internships**
 - Performing **technical visits**
 - Attending **training courses**
 - Attending **conferences**
- Focussed mostly on **implicit** and **tacit knowledge**
- Based on **learners needs**
 - Applicants can contact programme partners directly with specific questions
 - List of infrastructures is available on School of RWM website: <https://euradschool.eu/infrastructures/>
- Programme partners can offer internships

WP13 WEBINARS – OBJECTIVES

- The School of RWM organises webinars on **broad** and **specific** topics by subject-matter experts
- Aim is to **share knowledge** with the entire radioactive waste management community and beyond
- Recorded in order to **preserve knowledge** and **facilitate dissemination**



WP13 – SUPPORT THE PHD COMMUNITY

- **The School wants to support the EURAD PhD community by providing:**
 - Information on available/upcoming courses
 - The possibility to perform mobility actions
 - An overview of all PhD research performed in EURAD (<https://euradschool.eu/overview-of-phds/>)
 - A list of events of interest for PhD students
 - A discussion forum (<https://forum.euradschool.eu/>)
- **The aim is to foster a community between the PhD students, researchers and the Training and Mobility work package**

➔ **PhD students are the future key figures in radioactive waste management!**



EXPECTED IMPACTS

As per the original work package (WP) description, the objectives of the Training and Mobility WP are:

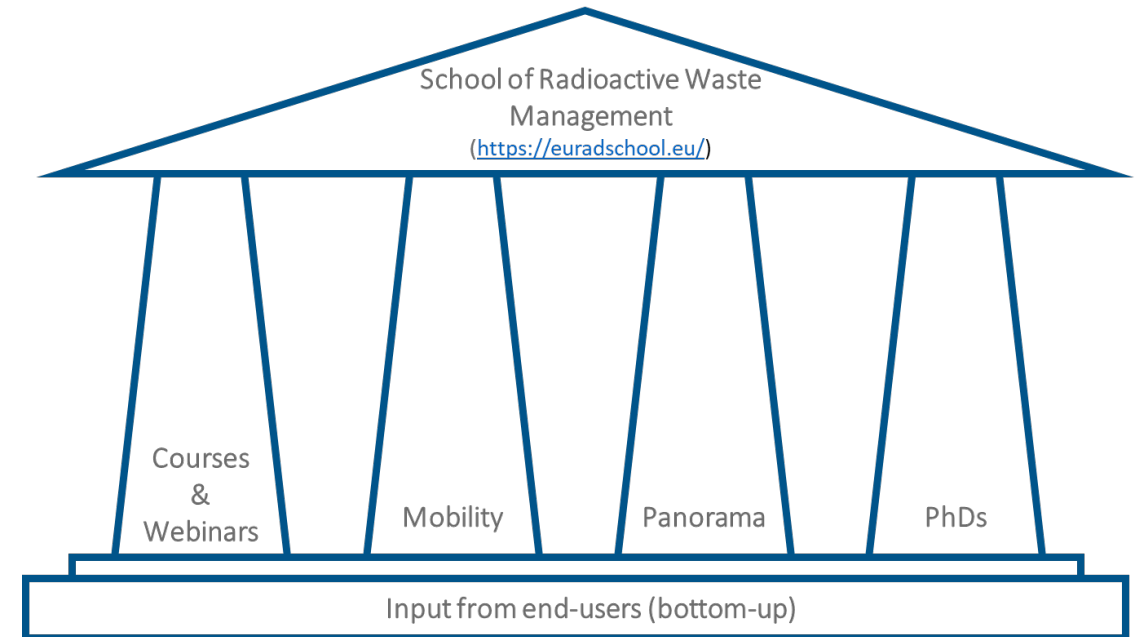
- To compose a diverse portfolio of tailored basic and specialised training courses for the end-users under the umbrella of a “School of RWM”
- To organise a Mobility Programme which provides access to dedicated infrastructures associated with the Mandated Actors/Linked Third Parties. Mobility actions can be seen either as a complementary action after one or more training course(s) or can be part of the Continuous Personal Development (CPD)

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RESULTS



The EURAD School of RWM served as an inspiration for the WP3 activities in PREDIS. Close collaboration between both EURAD WP13 and PREDIS WP3 was established. Furthermore, it serves as the foundation for WP2.4 in EURAD-2.

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RESULTS

Training courses:

- 15 training courses, including
 - Waste Acceptance Criteria Summer School
 - Safety Case Development and Review
 - Uncertainty Management
- 31 webinars
(mostly Lunch & Learn sessions)

Mobility:

- 98 mobility actions approved
- 93% success rate

PhDs:

- 4 PhD student-focused events
- Steps taken to launch a ‘Student Community’, managed by EURAD PhD students

RESULTS - TRAINING COURSES

Title	Date	Location
EURAD Training on Multiphysical couplings in geomechanics	January 20 – 24, 2020	University of Liège, Belgium
Introductory course on EURAD and Radioactive Waste Management	September 14, 2020	Online
WP FUTURE Education & Training Event on the scientific basis and safety relevant aspects of radionuclide transport and retention	November 17, 2021	Online
EURAD Training Course on Safety Case Development and Review	November 28 – December 2, 2022	SURO, Prague, Czech Republic
Information session and discussion on the Spent Fuel State-of-Knowledge document	January 18, 2023	Online
Geochemical and Reactive Transport Modelling for Geological Disposal	February 6 – 10, 2023	University of Bern, Switzerland
EURAD Training course on Uncertainty Management	February 14 – 16, 2023	BelV, Brussels, Belgium
Information and discussion session on the SoK document on Containers	June 5, 2023	Online
Training course Multiphysics and multiscale coupled processes in geomaterials – Focus on thermal effects and gas transfer impact on the behaviour of geomaterials	August 28 – September 1, 2023	University of Liège, Belgium
EURAD-PREDIS Summer School on Waste Acceptance Criteria	September 4 – 8, 2023	Rez Research Centre, Czech Republic
Workshop – Ukrainian experience from exercising radioactive waste management under exceptional conditions	October 16, 2023	Online
EURAD Training course on application of Requirement Management Systems	January 16 – 18; 2024	Mercure Budapest Castle Hill, Hungary
EURAD Training course on Monitoring in Geological Disposal facilities of radioactive waste	January 22 – 26, 2024	Online

RESULTS – WEBINARS (SELECTION OUT OF 32 WEBINARS ORGANISED*)

Title	Date	Number of live participants
Implementation of the world's first geologic disposal facility for spent nuclear fuel – Status update from Finland	22/06/2022	82
Knowledge Management in the German NWMO (BGE) – Origin, approach and practical implementation	29/06/2022	50
A pluralistic tool of dialogue on RWM: the Pathway Evaluation Process (PEP)	28/09/2022	40
The NEA Forum on Stakeholder Confidence: A Platform to Share Knowledge on Stakeholder Engagement in Radioactive Waste Management	2/11/2022	47
The role of Knowledge Management in Civil Society	30/11/2022	23
Guidance on Cost Assessment and Financing Schemes of Radioactive Waste Management Programmes	23/01/2023	70
Introduction to EC projects HARPERS and HARMONIZE	25/01/2023	23
Mission (almost) completed. The Swiss proposal for a combined repository in clay rocks.	22/02/2023	185
OFFERR - eurOpean platForm For accEssing nucleaR R&d facilities	31/05/2023	36
Advisory Board Committee (ESK)	28/02/2024	27
“Plus minus what?” - Uncertainty in destructive spent nuclear fuel inventory analysis	14/02/2024	53

* All webinars can be consulted via <https://euradschool.eu/events/category/eurad-webinar/list/?eventDisplay=past>

RESULTS - MOBILITY

At the end EURAD-1, there were:

- 105 complete applications
- 98 applications approved
- 7 applications rejected (due to illegibility)
- 79 mobility reports published online

MOBILITY MISSION REPORT

This work has been partially supported by the EURAD project that has received funding from H2020-EURATOM 1.2 under grant agreement ID 847593.

The information included in this mission report consists of personal data of applicants, and in the frame of GDPR we ask you place emphasis on its integrity: the personal data in this mission report cannot be used for purposes other than the evaluation and the management of EURAD Mobility Programme. For the avoidance of doubt, this information – out of its nature – is confidential information as mentioned in Article 10.1 of the EURAD Consortium Agreement Version (17/09/2019) with effective date of 1 June 2019 (although it might not be explicitly marked as such).

KLIKNETE NEBO KLEPNETE SEM A ZADEJTE TEXT.

MISSION TITLE

Reactive transport and geochemical modelling in engineered and geological barrier systems.

DESCRIPTION

Concerned organisations

Research entities (Lithuanian Energy Institute, SCK-CEN)

Concerned infrastructures or facilities

High-performance computing

Concerned phases

Phase 1: Site evaluation and site selection

Phase 5: Post-closure

Themes and topics

Theme 3: Engineered barrier system (EBS) properties, function and long-term performance

RESULTS – PHD COMMUNITY

At the end EURAD-1, there were:

- Over 120 PhD students involved
- 4 PhD student-focused events
- Steps taken to launch a 'Student Community', managed by EURAD PhD students



EURAD and PREDIS PhD students discussing among peers during the 3rd EURAD Annual Event.



Drs. Virginie Solans presenting her work in WP8 during the Student Session of the 3rd EURAD Annual Event.



CONCLUSION AND OUTLOOK

Having a competent workforce, now and in the future, is crucial for establishing safe and sustainable RWM programmes throughout Europe.

Therefore, there is a large need to continue the School of RWM's competence building activities beyond EURAD.

The School of RWM's activities will continue within EURAD-2's Knowledge Management Programme (WP2 Task 4) based on the feedback and lessons learned from EURAD-1 and PREDIS.

THANK YOU FOR YOUR ATTENTION

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°847593