

Meeting of Programme Committee – Fission Configuration, 15 March 2022

EURAD – European Joint Programme on Radioactive Waste Management:

Status and Expectations

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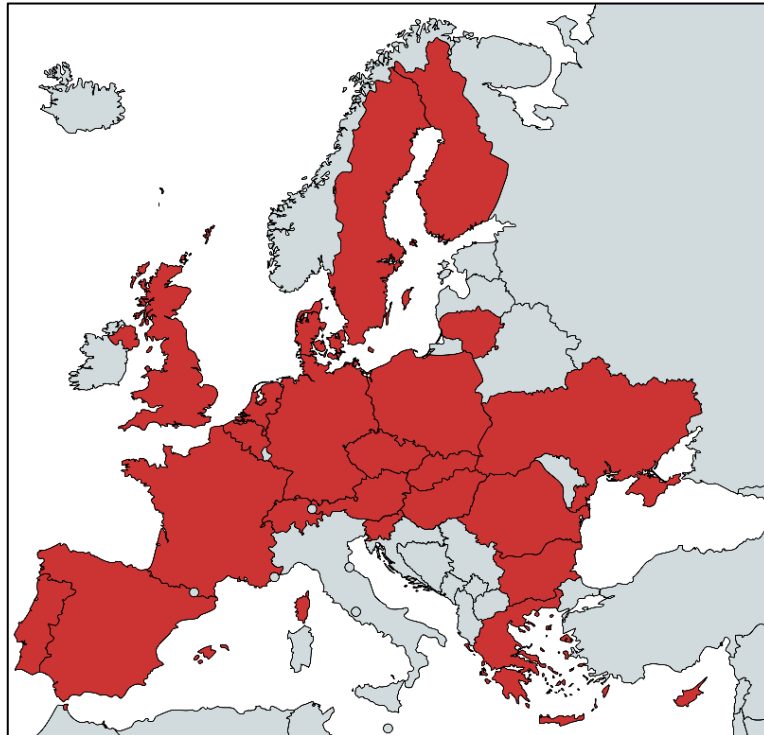
My presentation

- **Introduction of EURAD**
- **What made it possible to have EURAD with its powerful organisational format**
- **Current status of EURAD**
- **Looking into the future**

EURAD - Key Characteristics

- Participation of **23 countries** with rather **different boundary conditions**
 - **advanced programs** vs **early stage programs**
 - programs with **large inventories** vs programs with **small inventories** with **differences in 'complexity'** of the waste inventories of the different programs
- **Participants** of EURAD with **clearly defined roles** in their **national program (mandated actors: 51)**, supported by **linked 3rd parties (62)** and **international partners (3)**
- **Civil society** involved – 22 members in the CS larger group
- Overall: **116 organisations** with ~ **800 individuals**
- **End-user groups** with more than 100 persons from 21 countries (we encourage broader participation)
- Interaction with **international organisations** (IAEA, OECD/NEA) & **other projects**

EURAD – Countries & Mandated Actors



23 countries with ...

Waste Management
Organisations: 19

Regulatory Technical
Support Organisations 13

Nationally funded
Research Entities: 19

... and linked 3rd parties & international partners



The Vision of the European Joint Programme EURAD

Provide added value to member states in their timely implementation of RWM activities

The vision of the European Joint Programme on Radioactive Waste Management (EURAD) is:

“A step change in European collaboration towards safe radioactive waste management (RWM), including disposal, through the development of a robust and sustained science, technology and knowledge management programme that supports timely implementation of RWM activities and serves to foster mutual understanding and trust between Joint Programme participants”.

By step-change we mean a new era of more effective and efficient use of public RD&D funding in Europe, and a deepening of research-cooperation between Member States. We aim to implement a strategic Joint Programme of research and knowledge management activities at the European level, bringing together and complementing national EU Member State programmes in order to ensure cutting edge knowledge creation and preservation in view of delivering safe, sustainable and publicly acceptable solutions for the management of radioactive waste across Europe now and in the future.

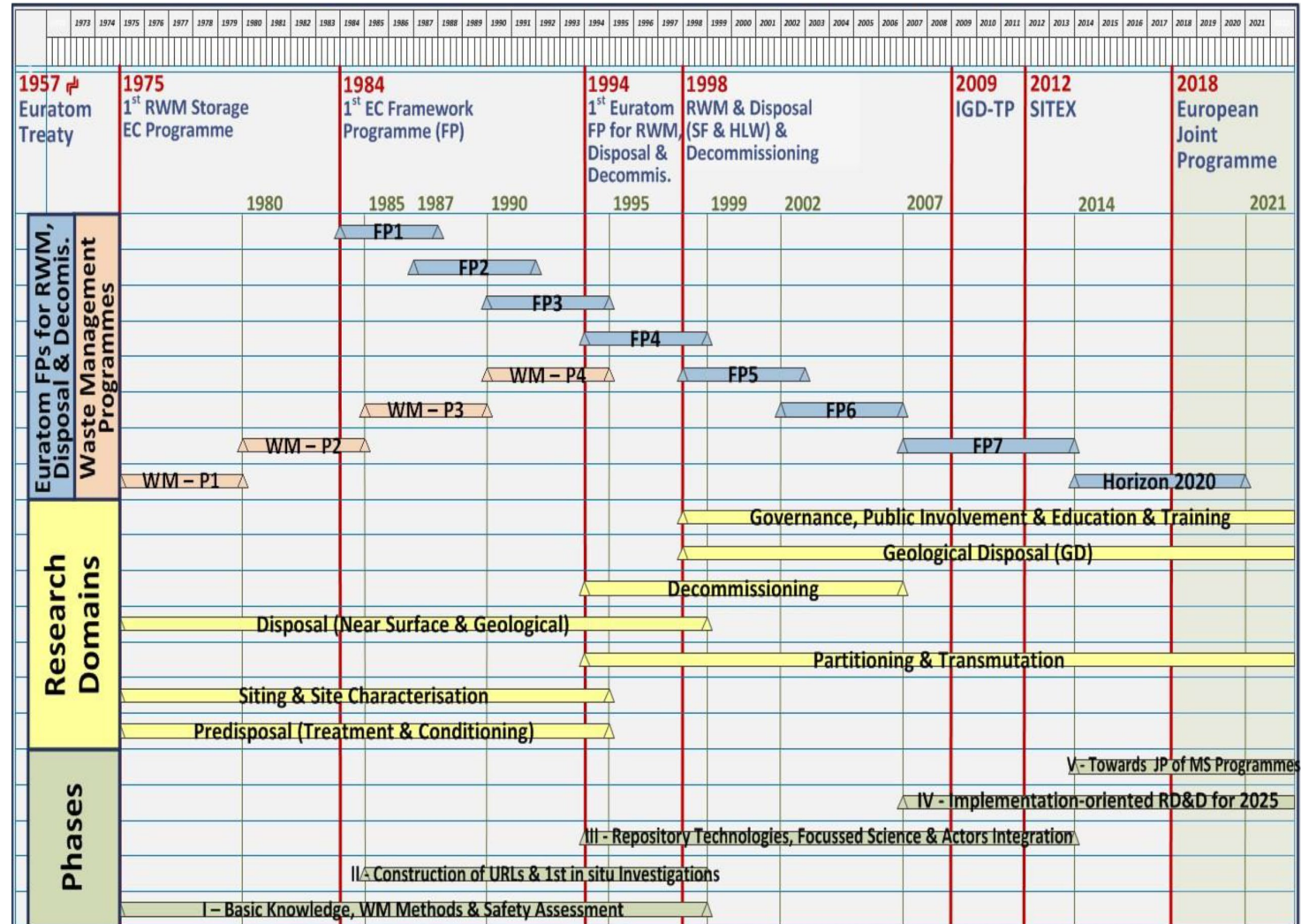
The Vision of the European Joint Programme EURAD

Provide added value to member states in their timely implementation of RWM activities

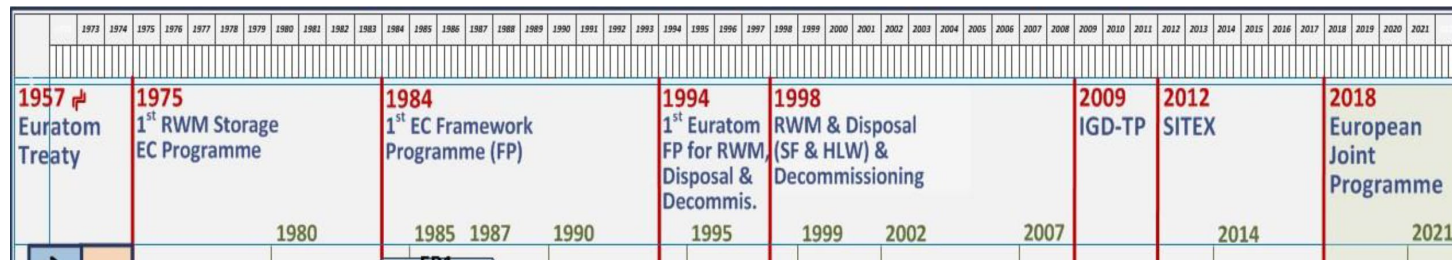
Key characteristics of EURAD (according to vision)

- EURAD **complements national RDD programmes**
- Joint programming provide **added value** at the European level (more efficient, better collaboration (incl. swarm intelligence), increased learning from each other)
- Joint programming builds on **using existing networks** (colleges, connections to civil society) to **drive the program**, with **coordinated activities** (with interaction)
- EURAD delivers **cutting-edge RDD**, allows broad **networking** (strategic studies, etc) and has a strong **knowledge management programme**
- These elements are considered to be a **step change in European collaboration**

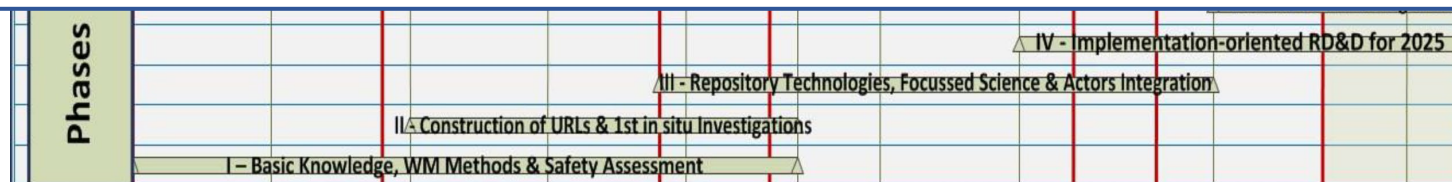
EURAD – a step change compared to earlier EC co-funded activities



EURAD – a step change compared to earlier EC co-funded activities



- **European projects** have a long history, with themes addressed and project structure evolving over time
- For many years: **competitive**, organized through **framework programmes**
- **Strengthening cooperation** → **technology platforms** (e.g. IGD-TP)
- → **Joint Programming** → checking the **possibilities** (JOPRAD) → **EURAD**
- EURAD has led to a **step change in European collaboration**



Overview EURAD – favourable framework for Joint Programming

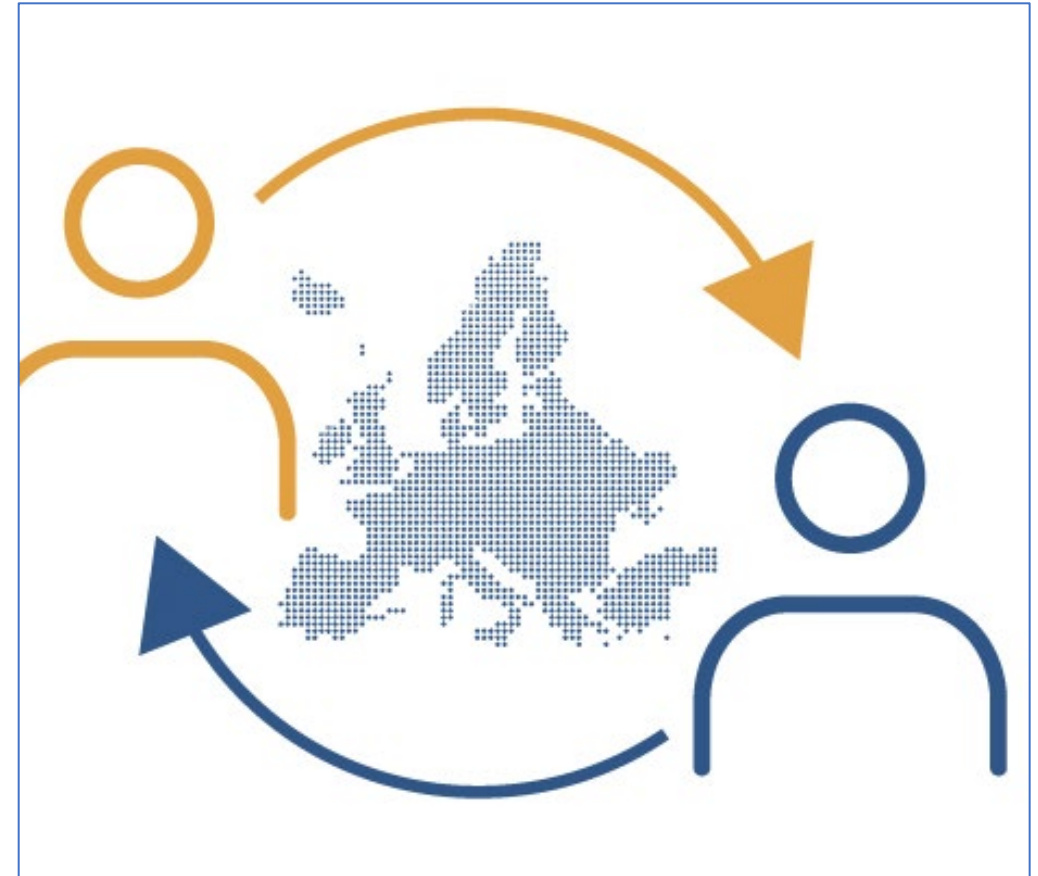
- The **Euratom WP 2018** provided the **opportunity to implement Joint Programming** – preparatory work by EC is highly appreciated & acknowledged
- The **preparatory work** (EC project JOPRAD) allowed to **act thoughtfully upon the call** – preparation **needed significant resources & time** (important for new EJP)
- The **EURAD founding documents** provide a **suitable framework** – joint programming through **3 colleges, interacting with civil society** with **suitable management structure** (Coordinator, PMO, Bureau) with clearly defined **decision-making procedures**
- **Joint Programming** allowed to **use experience** with 1st wave WPs **work programmes** to **improve** 2nd wave WPs programmes (increased interactions & contributions to KM, ...)
- Nearly in parallel, **development of PREDIS** (pre-disposal management of radioactive waste) – coordination / cooperation with EURAD envisaged already from the beginning on

Overview EURAD – Key Characteristics & Achievements

- **Joint programming**
 - **participants mandated** by responsible entities of **member states** & **linked 3rd parties**
 - ... representing **three colleges**
 - **Waste Management Organisations** (WMO, responsible for implementation)
 - **Technical support organisations** (TSO, supporting regulatory activities)
 - **Research entities** (RE, supporting all interested bodies)
 - ... and: **interaction with non-mandated participants** (end-users, civil society, ...)
- covering ...
 - **RD+D projects**
 - **Strategic studies**
 - **Knowledge management**
 - **Information dissemination & interactions** (including end-users, civil society, etc.)
- ... with a **roadmap** and a **strategic research agenda** as essential tools

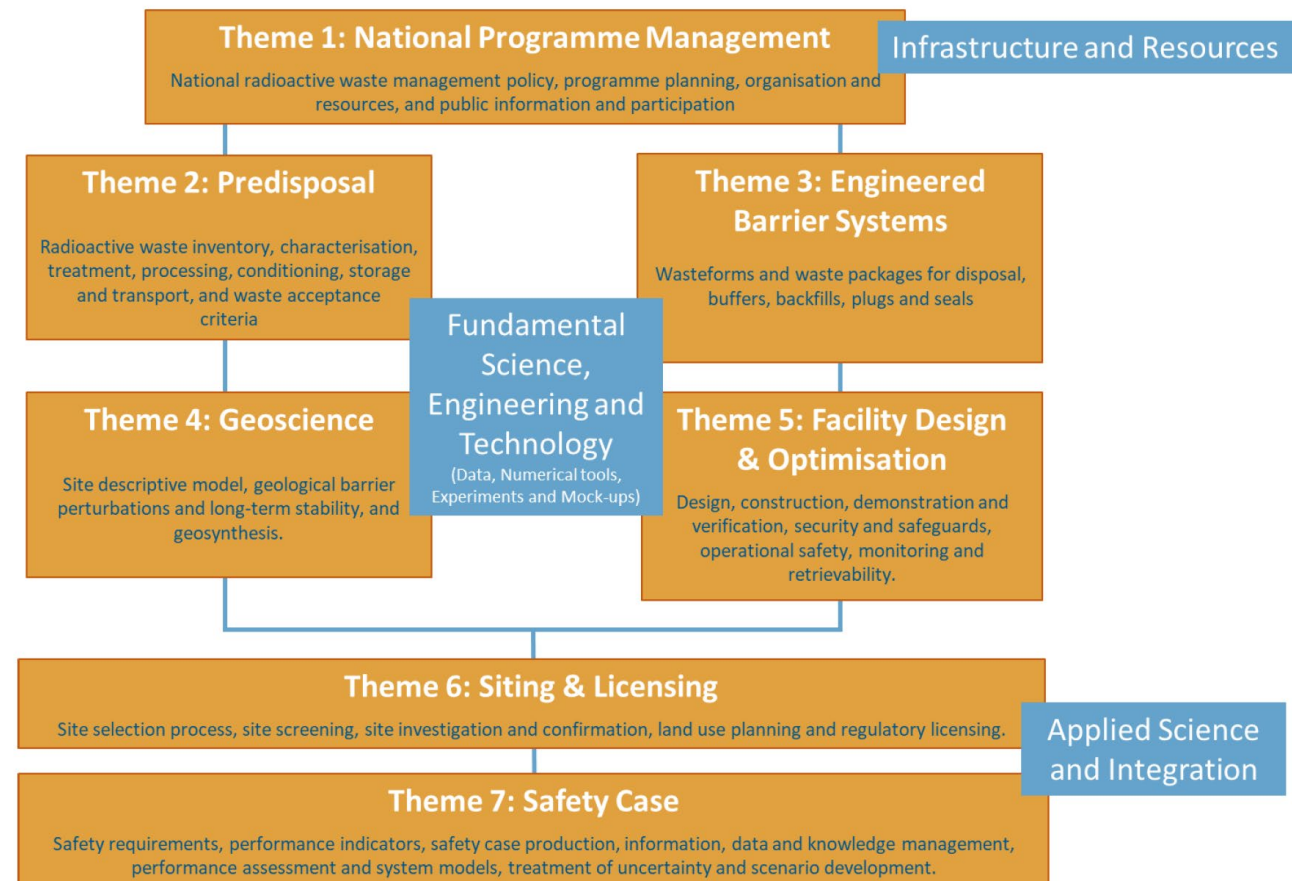
EURAD Objectives

- Based on **Strategic Research Agenda**, perform a cutting-edge **Science and Technology Programme**
- Identify and **elaborate upon complex issues** by bringing together interested actors to jointly conduct **Strategic Studies**
- Support **knowledge transfer** between Member-States and between generations with a strong **Knowledge Management Programme**
- Foster **Mutual Understanding** and **Trust** between Colleges and Civil Society participants and other stakeholders



Strategic Research Agenda (SRA) – an important element of a EJP

- structured in **7 overarching themes**
- ... combined with **roadmap** that provides **structure and context**
- **important input** to define WPs for EURAD
- allows to include **new findings & experience** - **update underway**
- the **update** - an **important input** for any **future waste management EJP**



Added value offered by EURAD – Science & Platform for Networking

- **EURAD provides cutting-edge science** in areas of interest to a broad range of organisations
- Based on the **concept of 'Joint Programming'**, EURAD provides a **platform for interaction**
 - Periodic update of the **strategic research agenda** (SRA): 'wish-list' for future joint RDD, strategic studies & knowledge management activities
 - Conduct spectrum of **RDD work packages** (ACED, CORI, ConCorD, DONUT; FUTuRE, GAS, HITEC, MAGIC, MODATS, SFC – see appended overheads) with strong interaction between them
 - Some **Strategic Studies** on emerging issues (UMAN, ROUTES – see appended overheads)
 - **Platform with the key actors** from national programs in waste management, with the aim to **form common views** on important issues
 - Waste Management Organisations
 - Technical Support Organisations (regulatory view)
 - Research Entities
 - ... to get a better understanding on the **context of all scientific activities** related to disposal

EURAD: Science & Networking – covers broad spectrum of issues (12 WPs)

- **Source term, engineered barriers, nearfield**

- SFC - Spent Fuel Characterization and Evolution Until Disposal (SFC)
- ConCorD - Container Corrosion under disposal conditions
- ACED - Assessment of Chemical Evolution of ILW and HLW Disposal cells
- MAGIC - Chemo-mechanical aging of cementitious materials

- **Geosphere barrier & clay material barriers (e.g. buffer, seals, ...)**

- FUTURE - Fundamental understanding of radionuclide retention

- **Perturbing effects**

- CORI - Cement-Organic-Radionuclide Interactions
- GAS - Mechanistic understanding of gas transport in clay materials
- HITEC - Influence of temperature on clay-based material behaviour

- **Methods, strategies, interactions & tools**

- ROUTES - Waste management routes in Europe from cradle to grave (... with strong interface with PREDIS)
- UMAN - Uncertainty Management multi-Actor Network
- DONUT - Development and improvement Of Numerical methods and Tools for modelling coupled processes
- MODATS - Monitoring equipment and data treatment for safe repository operation and staged closure

Added value offered by EURAD – Knowledge Management

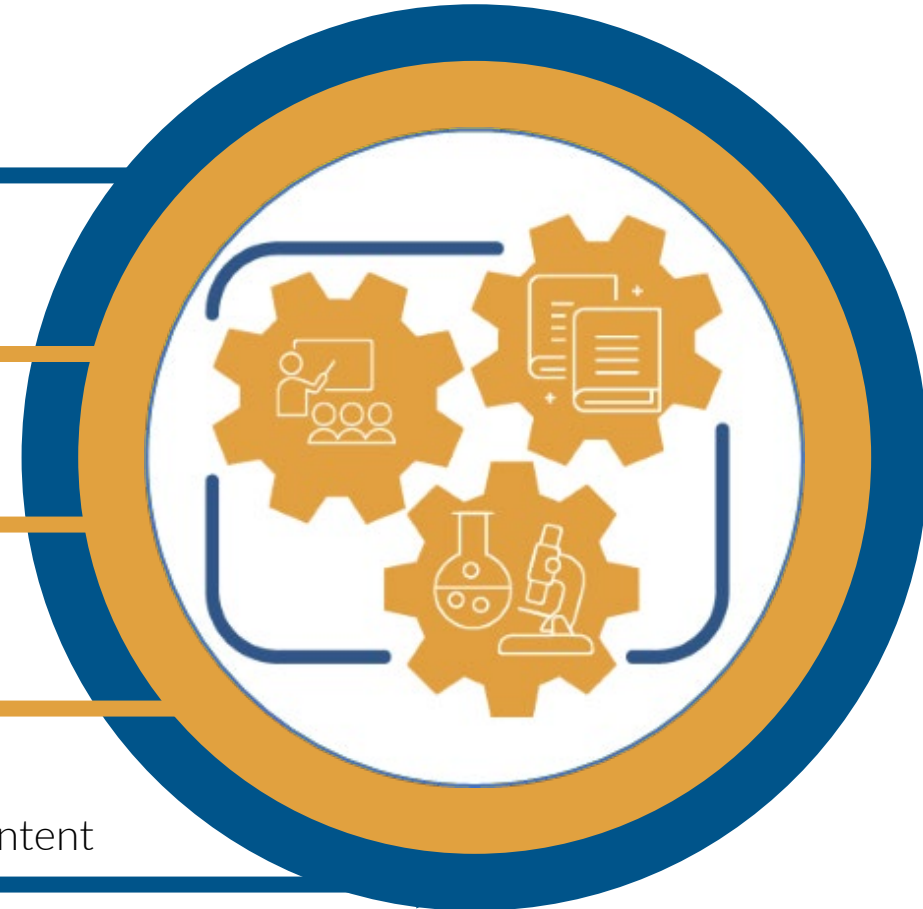
EURAD maintains a **knowledge management programme** to **support the member states** in their **timely implementation of safe disposal solutions**, and consists of ...

- a **roadmap** describing the relevant **phases & themes** for implementing disposal solutions
 - ... and provides the **structure** and **context** to clearly see **which themes** are **when and why** important for **repository implementation** and to **understand the interactions** between different **themes**
 - ... and supports the **integration** of **the knowledge available** into the **national programmes**
 - ... and identifies **key capabilities** needed (**competencies & infrastructure**) for successful implementation by national programmes
- capturing the current **state-of-knowledge** and **sign-posting to key references** for each of the roadmap themes (WP11 'state-of-knowledge', in progress)
- **guidance** (best practice and lessons learned) **for key issues** (WP12 'guidance', in progress)
- a programme for **training and mobility** (WP13 'training & mobility', on-going) & provides a **platform for networking** e.g. with webinars (WP 13, together with all other WPs & PREDIS)

With these elements, EURAD supports **knowledge transfer** from **advanced programs to early stage programs** and **knowledge transfer between generations**

EURAD Knowledge Management & Networking Programme

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



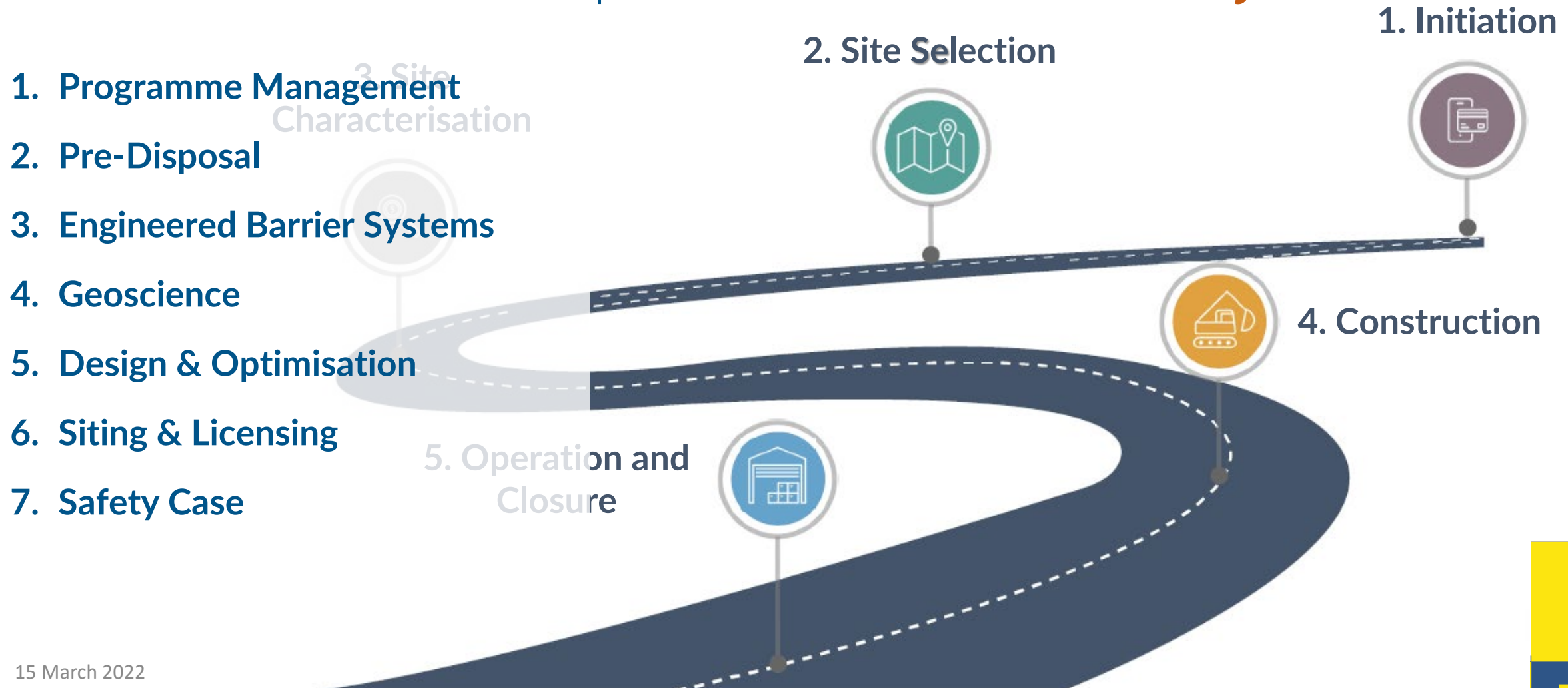
EURAD Roadmap – structure for knowledge management: phases & themes

The phases (from waste generation to closure of repository)



EURAD Roadmap – structure for knowledge management: phases & themes

... and the **themes** needed for implementation → '*what*', '*when*', '*why*'



EURAD – Status ad mid-term

Significant progress has been made

- **RDD & Strategic Studies WPs 'on track'** (although with modified schedules due to pandemic)
- Strong learning-curve with **Knowledge Management** (a lot of experience with practicalities) and importance of **connection to Roadmap**
- EURAD supports & encourages **interaction** between WPs (incl. Civil Society) & with external bodies, including **participation of end-users**
- **Joint Programming** – lively interaction between colleges (WMO, TSO, RE) and with Civil Society also leading to increased mutual understanding
- Strong & successful **cooperation with PREDIS**
- **EC mid-term review** with positive response (preliminary internal assessment)

EURAD – Looking Ahead

- Results of **EC mid-term review** – analysis of review results to improve EURAD
- In conjunction with EURADWASTE '22 conference, **workshop** with Member State representatives **to discuss achievements of EURAD** and **about future EJP**
- **EURADWASTE '22 conference** – strong participation expected with discussions allowing to elicit **input for scoping any future activities**
- **Update of SRA** (Strategic Research & Knowledge Management Agenda) underway: the value of an existing platform by Joint Programming to **scope potential future activities**
- Measures taken to **successfully complete WPs** (thoughtful use of reserve budget, timely delivery of reviewed deliverables, take advantage of feedback, ...)
- Promote **end-user feedback** (member states with their formal bodies, EURAD end-users, ...)
- Overall, we see essential benefits from a **follow-up of EURAD with future EJP**

EURAD – Looking Ahead

- **'Joint programming' will fulfil expectations of end-users** (we are confident on this)
 - we **help member states** in their timely implementation of RWM activities
 - **scientific excellence** creates new **knowledge**, educates **scientists** and broadens **capabilities**
 - **existing knowledge** is made **available & accessible** in an efficient manner
 - we **interact & cooperate** in a 'systematic way' to achieve **integration** effectively & efficiently
 - **trust & mutual understanding** exists between the partners/colleges (*we are a big family*)
 - ...
- **... and we have developed a joint understanding on the elements of a next EJP**
 - **update of 'SRA'** (method/ results) to **guide future work** and to **maintain & broaden competencies** and to ensure **inclusiveness** to get **new participants** (new themes & new organisations)
 - continuation of a strong **Knowledge Management** programme (a **longer-term on-going process**)
 - develop clear ideas on how to ensure availability of **critical infrastructure** also in future
 - ...

Thank you for your attention !

<https://www.ejp-eurad.eu>



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Questions? Comments?