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EURAD: a step change in European Joint Research Programming towards Safe Radioactive Waste Management

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EURAD: A STEP CHANGE IN EUROPEAN JOINT RESEARCH PROGRAMMING TOWARDS SAFE RADIOACTIVE WASTE MANAGEMENT

25 October 2021 • Bernd GRAMBOW (SUBATECH)



This project has received funding from the European Union's Horizon 2020 research and innovation programme 2014-2018 under grant agreement N°847593

RESEARCH ON GEOLOGICAL DISPOSAL OF RADIOACTIVE WASTE

- Started in 1957 by the proposition of the US NAS concerning disposal on land
- Research has a long term character, on many issues (source terms, migration...) for more than 50 years
- Funded by the EC since 1975 (1st to 3rd FWP) of individual partners, 1990-2002 of consortia, 2003-2007 of large integrated programs (NFPRO, FUNMIG...) and later reduction of size
- **Creation of IGDTP (2009) and SITEX (2013)**
 - Strong role of IGDTP in identification of key subjects
- **European waste directive in 2011:**
 - Requires arrangements for expertise and skills, Art.8
 - "arrangements for education and training, as well as research and development activities in order to obtain, maintain and to further develop necessary expertise and skills"



SOME QUESTIONS:

- How to account for the long term character of research, which will go on even after the construction of 1st disposal facilities?
- How to accommodate the needs of less advanced countries?
- How to integrate the acquired knowledge / information into the different national programmes?
- How to provide context and access/interlinkage of knowledge over generational changes?

SINCE EURADWASTE 2013 WE STARTED TO THINK HOW TO CHANGE, INITIATED BY C. DAVIES, PROJECT OFFICER OF THE EC



“Towards Joint Programming of EU Member States RD&D programmes for the management of radioactive waste

—

Contribution of the Horizon 2020 Euratom Research & Training programme ”

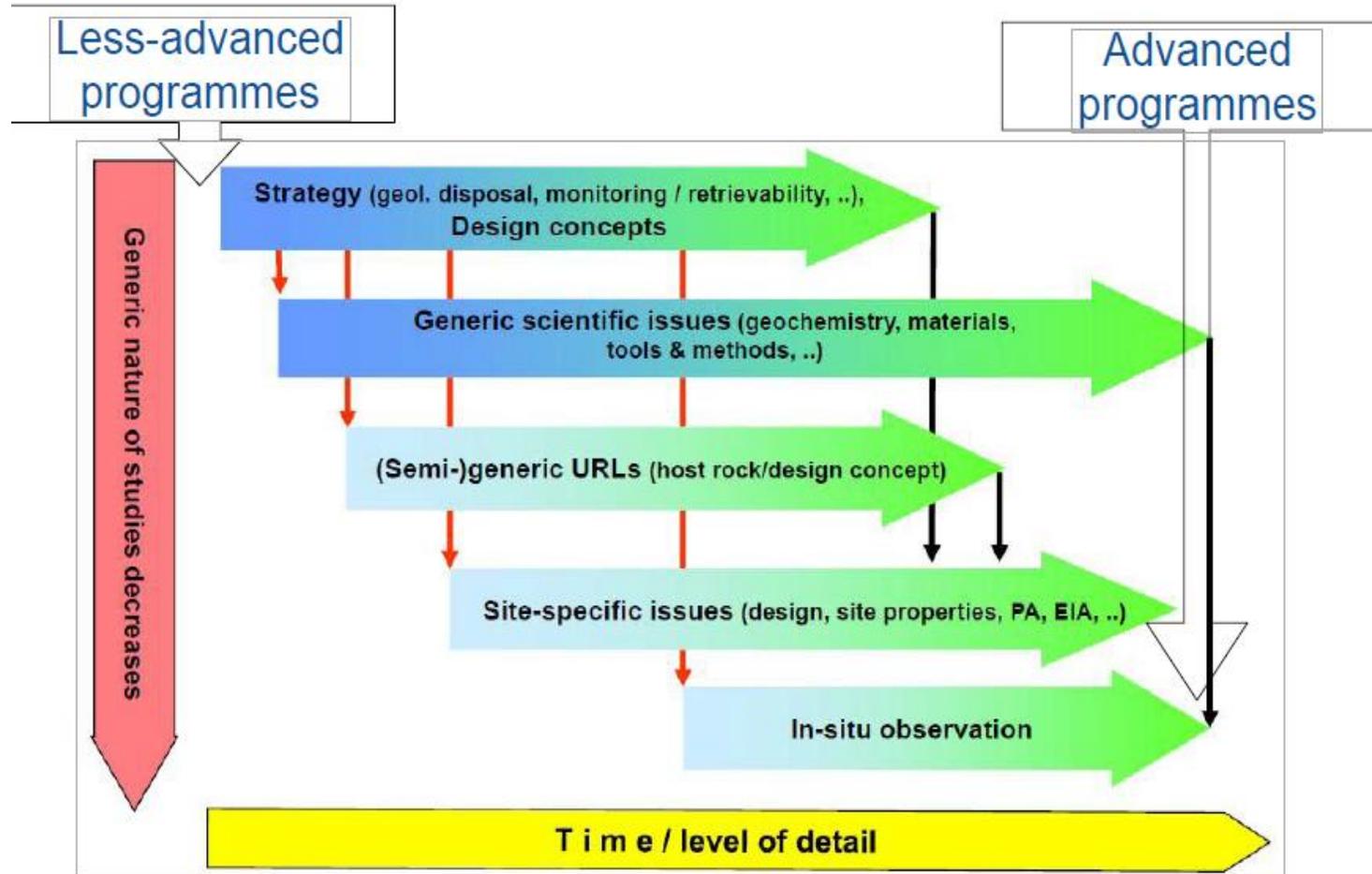
Christophe Davies

Project officer
European Commission
DG Research and Innovation
Unit G4 – Fission energy

Geodisposal 2014, Manchester, 24-26 June 2014



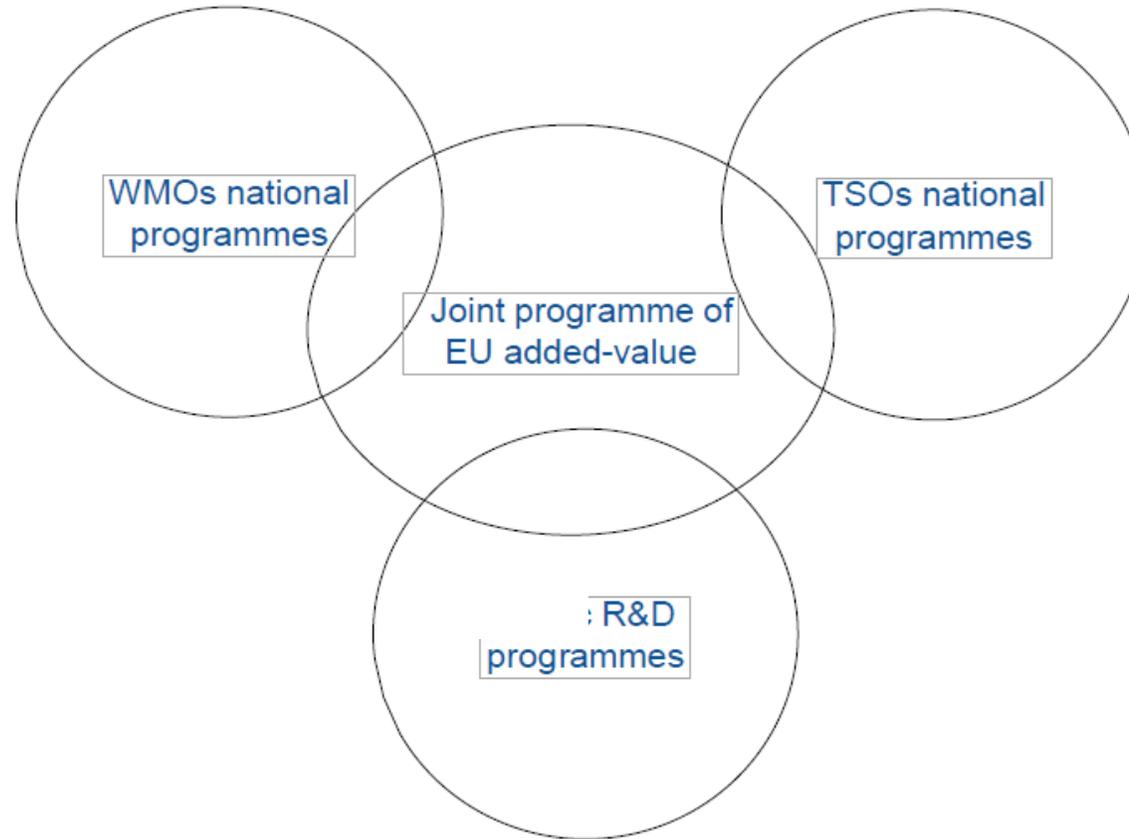
R&D needs are quite different



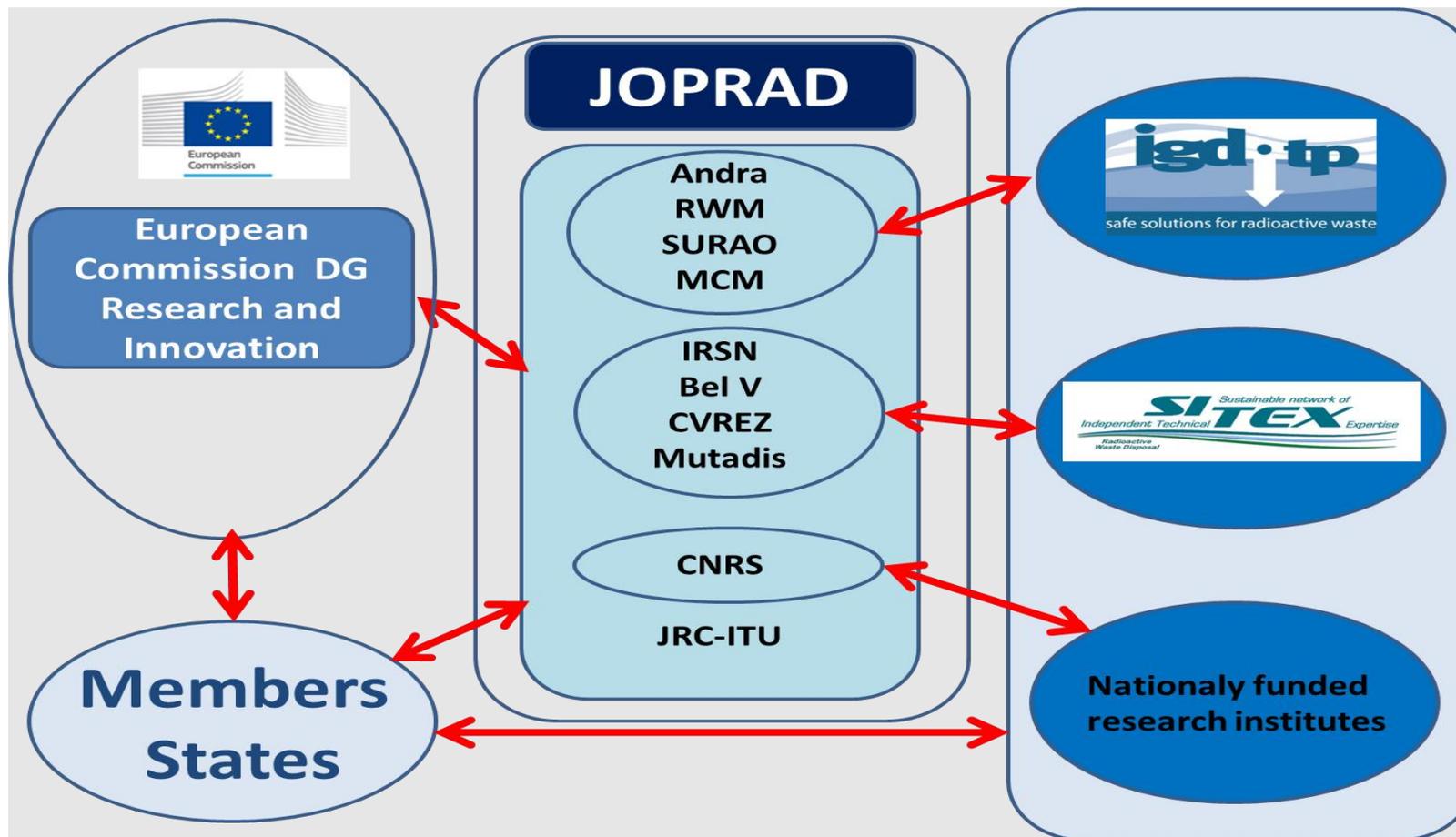
Way forward: towards Joint Programming of MS R&D programmes: (3)



→ *Euratom funding of a European joint programme between*



THE WAY FORWARD: FROM PROJECT ORIENTED FUNDING TO THE PREPARATION OF A JOINT EUROPEAN PROGRAMMING

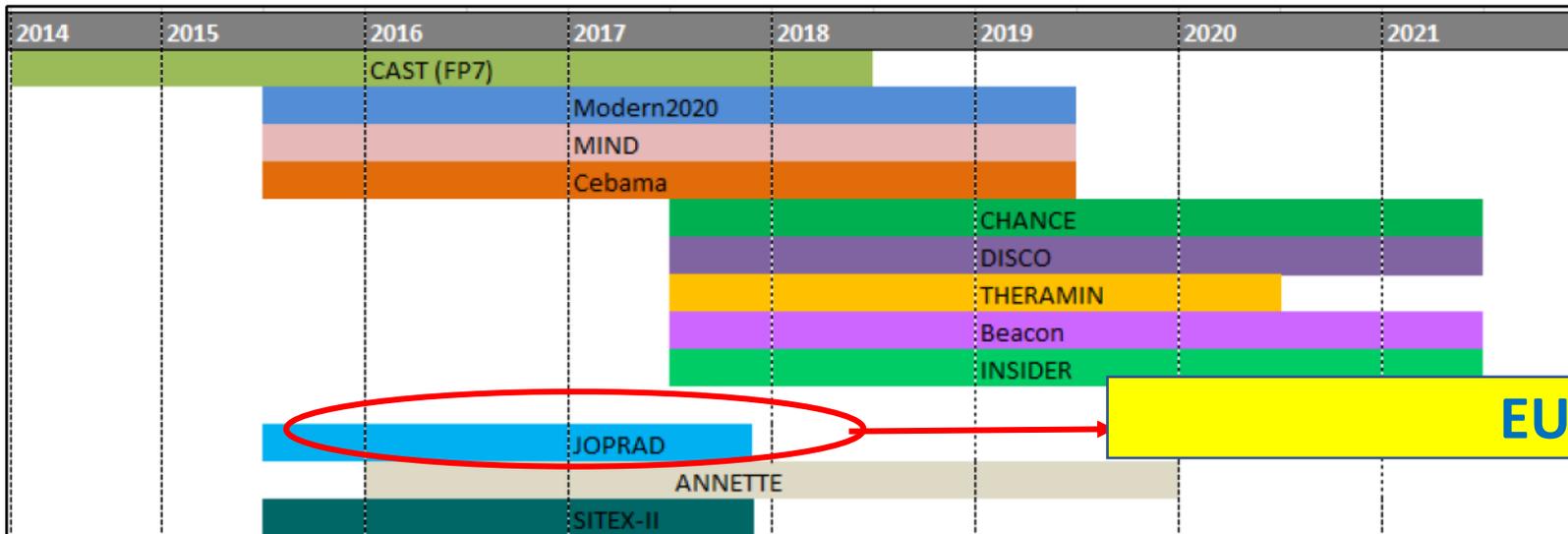


A LEAP FORWARD FOR THE NEXT TENS OF YEARS

“VISION

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 participants.”

We need clear views from member states and responsible organizations on the needs and scope of a future Joint Programme



List of EC ongoing projects at the time of the development of EURAD proposal

2024

eurad



JOINT OBJECTIVE AND INTERESTS FROM NATIONAL PROGRAMMES

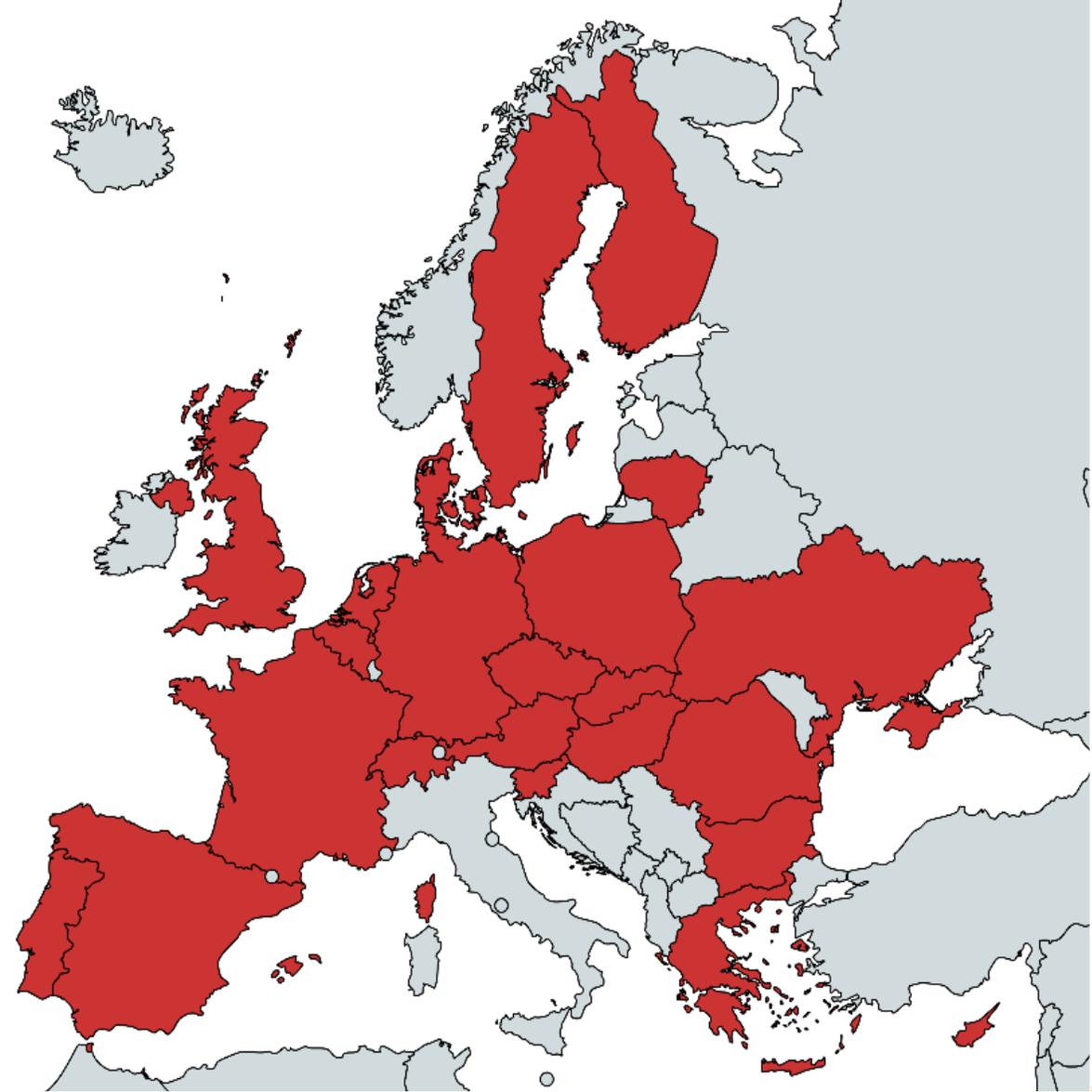
- A step change in linking national programmes to a European robust and sustained state-of-the-art science and technology programme
- A step change in consolidating efforts across Member-States, organisations and generations on Knowledge Management
- Elaborating across Europe upon complex and emerging issues by a step change in bringing together all interested actors and national programmes to jointly conduct Strategic Studies
- A step change in creating mutual understanding / trust between participants from WMO, TSO and RE from national programmes as well as other stakeholders, incl. from Civil Society

A schematic vision on separation and role of actors

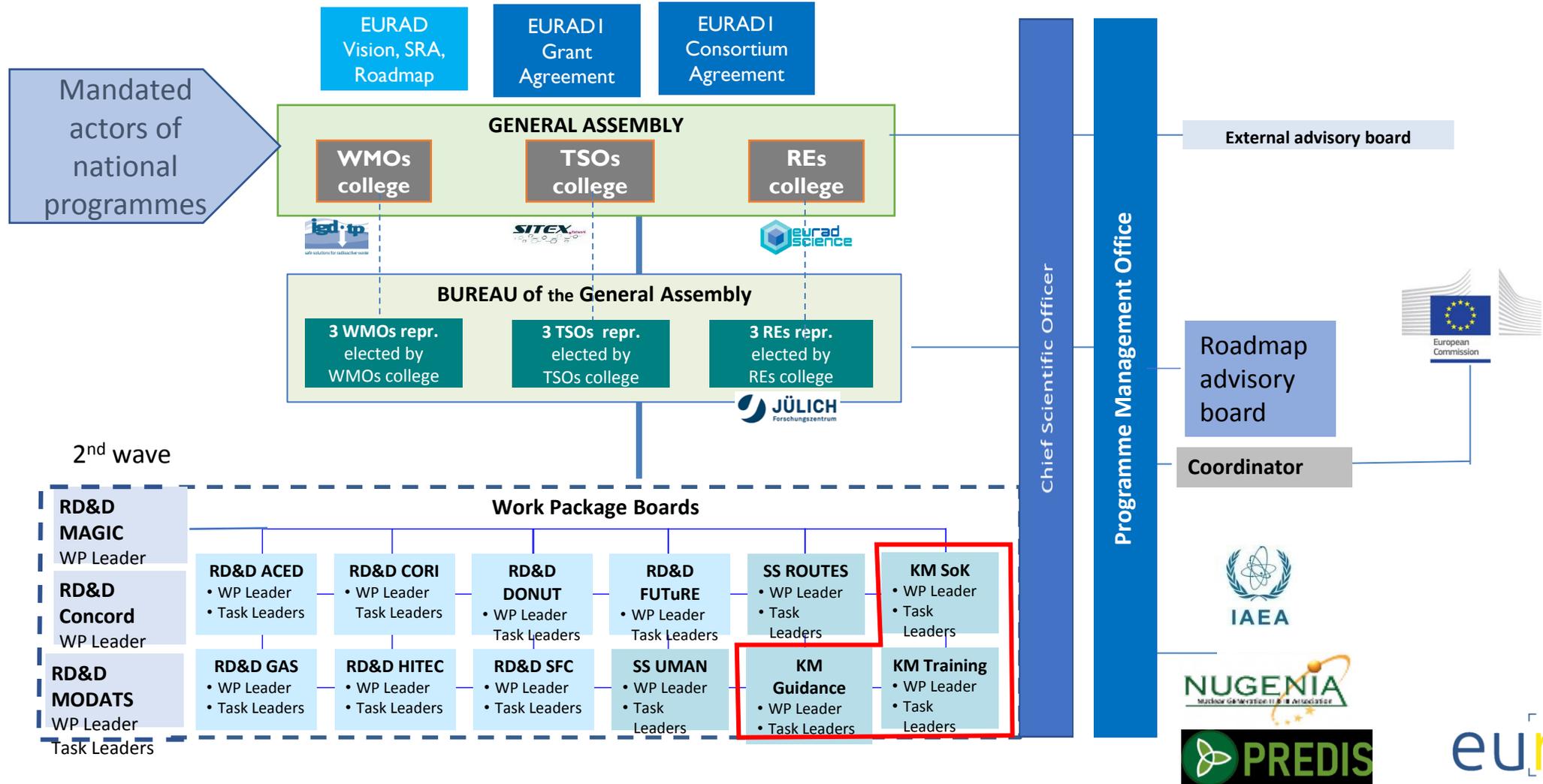


EURAD HAS DEVELOPED INTO A REAL COMMUNITY

- **51 Mandated actors from 23 European countries representing the following Colleges :**
 - Waste Management Organisation (WMO)
 - Technical Support Organisation (TSO)
 - Research Entity (RE)
 - More and less advanced countries
- **61 Linked Third Parties (mostly universities and research centres)**
- **3 International Partners**
- **Groups of Civil Society organisations**

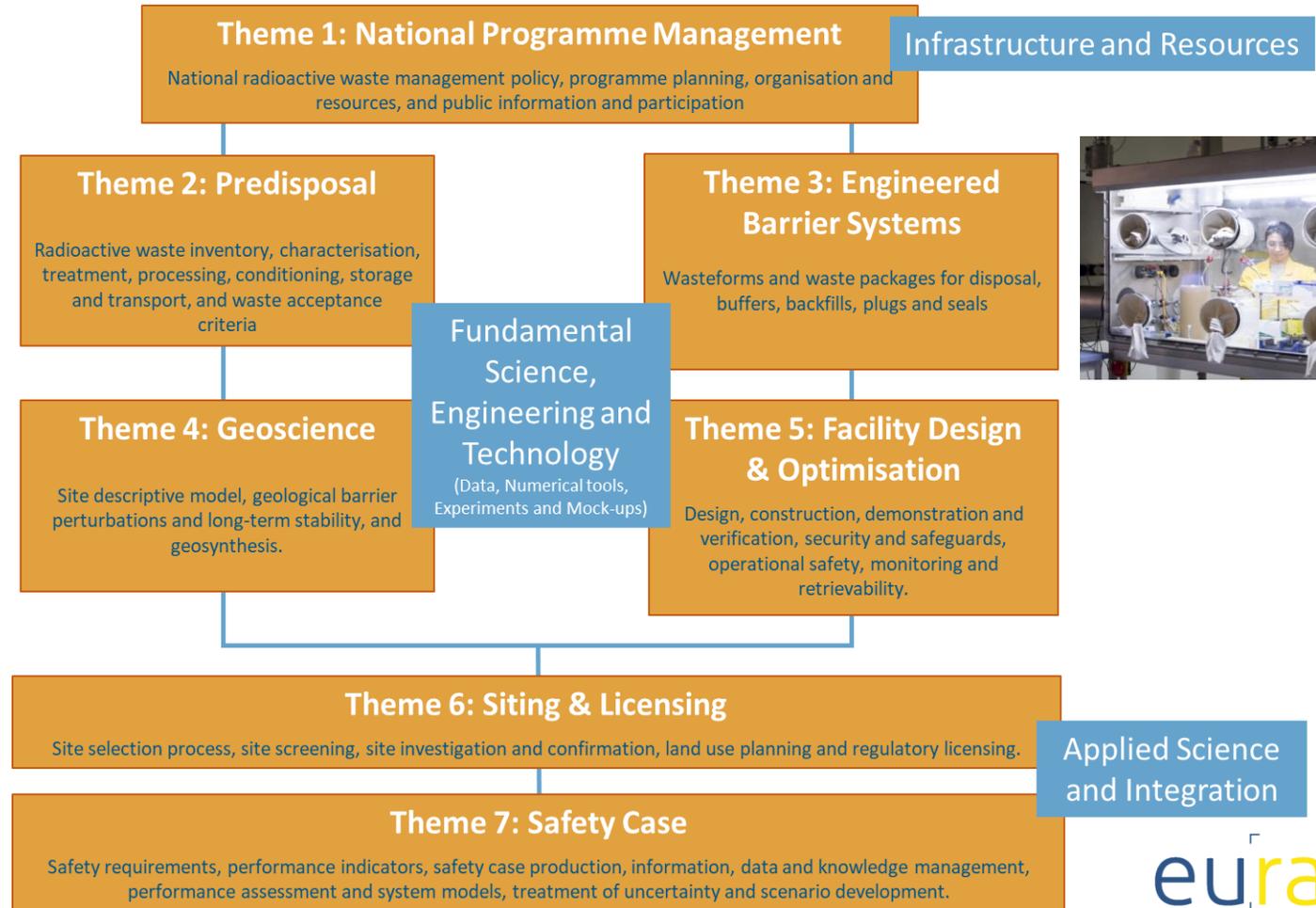


EJP EURAD1 (2019-2024) GOVERNANCE

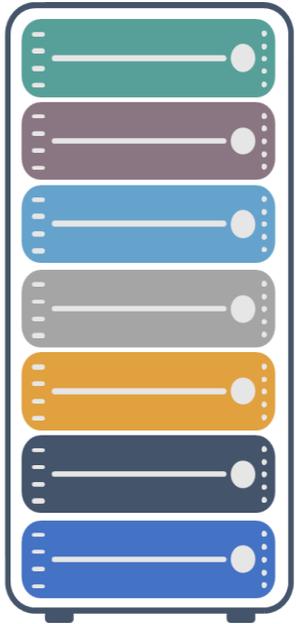


EURAD STRATEGIC RESEARCH AGENDA - GENERIC EUROPEAN ORIENTATIONS COVERING JOINT NATIONAL INTERESTS

- Shared
 - Vision
 - Roadmap
 - Strategic research agenda
 - Access to infrastructure
 - Knowledge
- Living and dynamic
 - Is in the process to be updated
- With a broad spectrum
 - Frames research and knowledge management objectives
 - Covers RWM activities from cradle to grave (does not cover decommissioning)



GENERIC EURAD ROADMAP - TOWARDS SHARED SYSTEMS UNDERSTANDING FOR TIMELY AND SAFE RWMD IMPLEMENTATION



- Programme Management
- Pre-Disposal
- Engineered Barrier Systems
- Geoscience
- Design & Optimisation
- Siting & Licensing
- Safety Case

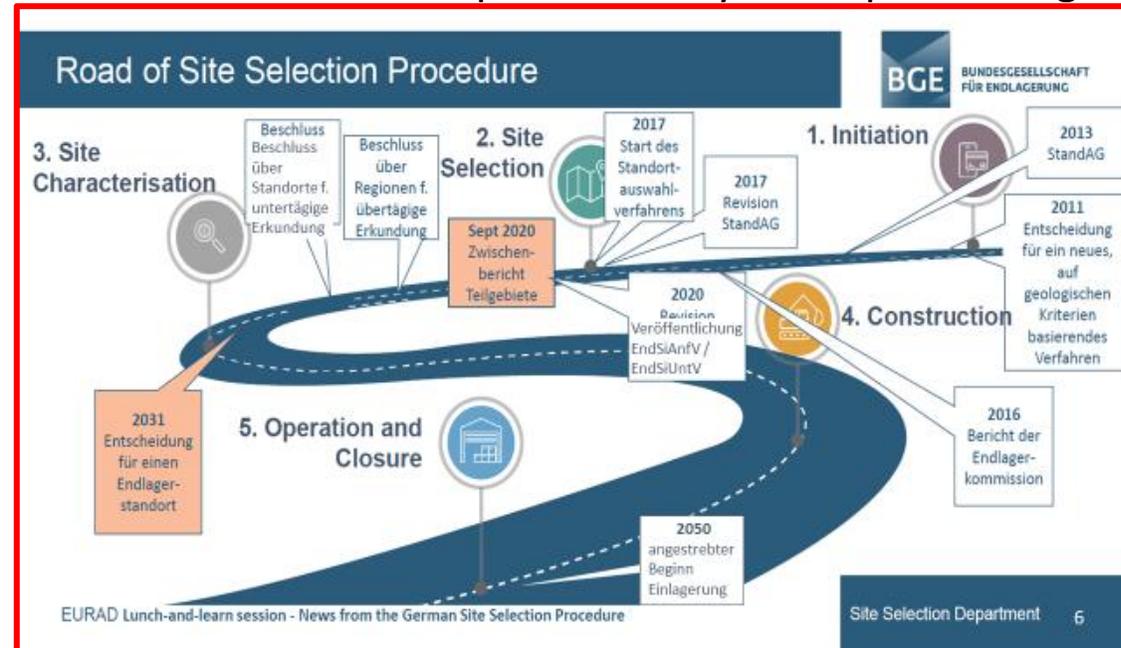
EURAD Roadmap Goals Breakdown Structure

Hierarchical breakdown: 7 Themes > 20 Sub-themes > ~ +70 Domains.

25 October 2021

Example

Link to national roadmap in Germany: example « Siting » (from BGE)



MRS Conference

EURAD ROADMAP – OVERVIEW ON THE 7 THEMES



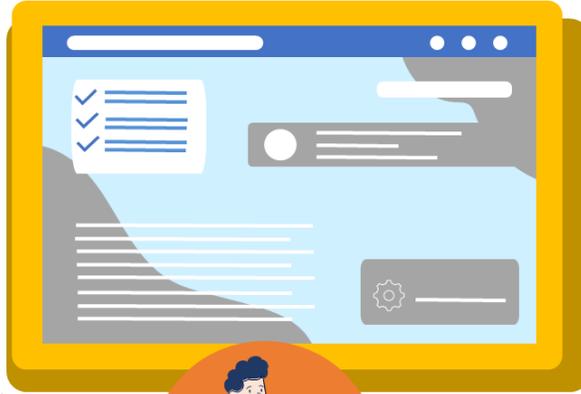
Typical Activities

Describes generically how activities evolve in each Theme.



Capability Needs

Knowledge, skills, laboratories, equipment, tools, technology, industrial manufacturing + more.



EURAD Roadmap – Domain Insights



Context

Detailed scientific evidence is linked to DGR safety and implementation goals.



Domain Maturity

Signposts to state of knowledge documents and ongoing RD&D.



Networks & Resources

Signposts to existing networks, training, and guidance.



State of knowledge reports

THE ROADMAP SHALL BECOME ACCESSIBLE IN USER FRIENDLY WIKI FORM

Work in progress under the leadership of BGE



eurad European Joint Programme in Radioactive Waste Management

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Main Page

Welcome to the EURAD Roadmap Wiki...*a short welcome text will be added here*

This Wiki is still under Construction! All Feedback and comments highly appreciated! To get an idea of the overall concept, check out the best developed Theme 3: Engineered Barrier System

For an 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

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
- 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)

EURAD Roadmap Guide [edit]

- What is EURAD about?
- What is this Roadmap about?
 - PATHWAYS THROUGH THE EURAD ROADMAP

navigation

- Main page
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search

Search wastebok

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administration

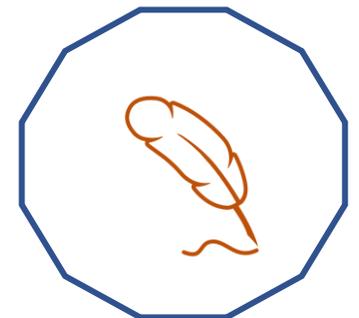
- Manage this wiki's core settings
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DEPLOYMENT – EURAD WORK PACKAGES

- **Research and Development – 10 work packages**
 - Developing and consolidating scientific and technical knowledge
 - Typical themes: Spent fuel, numerical models, disposal cells, radionuclide retention, cement/organics, gas transport, temperature effects, etc.
 - Example: “CORI” on Cement-Organics-Radionuclide-Interactions, coordinated by INE (M. Altmaier)
- **Strategic Studies – 2 work packages**
 - Enabling experts and specialists to network on methodological / strategical issues, examples:
 - UMAN: Views of different types of actors on uncertainty assessment and management
 - ROUTES: Assessment of Waste Management Routes across Europe considering different waste types and their specified endpoints.
- **Knowledge Management – 3 work packages**
 - State of Knowledge, coordinated by BGE
 - Descriptive methodological guidance and developing
 - Training modules and mobility measures
- **Coordination/Dissemination – 1 work package**
- **Civil society engagement**

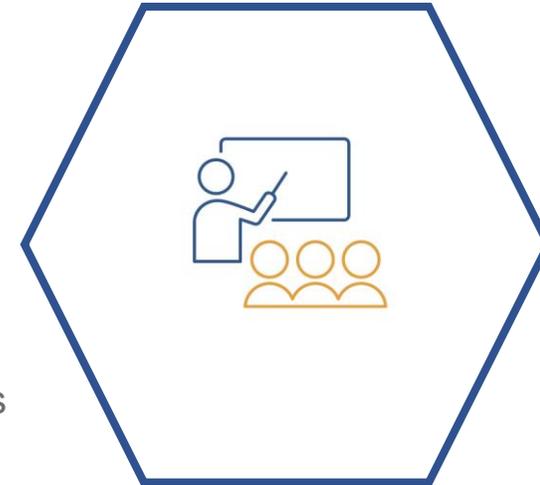
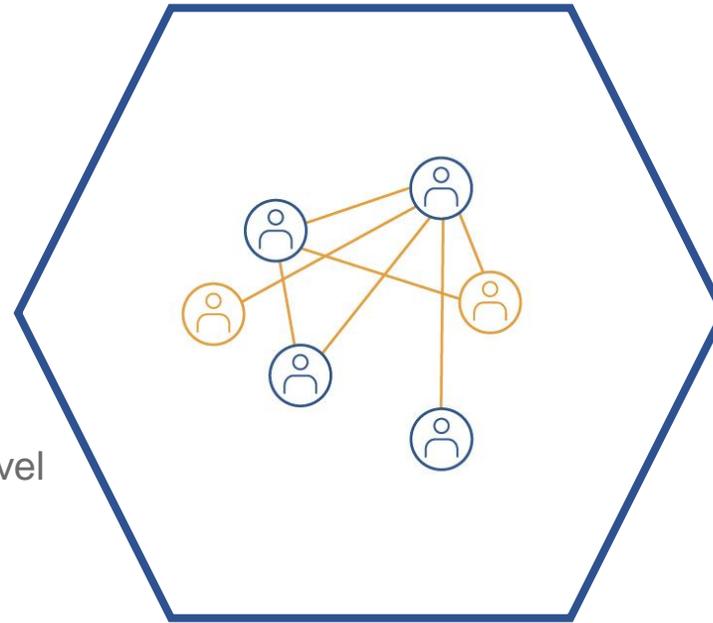
KEY ACHIEVEMENTS AFTER TWO YEARS

- **13 work packages running well + launch of a second wave**
 - Initial SotA produced in each R&D WP
 - Numerous deliverables and milestones
- **Integrated shared KM Programme and networking strategy**
 - Goals Breakdown Structure Roadmap
 - Theme overviews, domain insights, state of knowledge
 - Mobility Programme
 - Training and webinars
- **Successful involvement of civil society**



EURAD'S AMBITION

- **Complement the national Programs**
 - Support compliance with European regulations
 - Foster efficient use of RD&D resources at the EU level
 - Support RWM innovation and optimization
- **Ensure the sustainability of knowledge**
 - Developing and consolidating existing knowledge
 - Enhancing knowledge management and transfer between organizations, MS and generations
- **Act as a platform**
 - Foster mutual understanding and trust
 - Exchange and cooperation with national and international organizations and expert networks
 - Shall be used by national programs to actively interact with the scientific community at large – a clearly expressed interest by national programs in a EUROPEAN LONG TERM VISION is important for the continuation of EURAD towards EURAD2





THANK YOU

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