

A STEP CHANGE IN EUROPEAN JOINT COLLABORATION TOWARDS SAFE RADIOACTIVE WASTE MANAGEMENT

20/05/2022 • Louise Théodon (Andra – EURAD Coordinator)



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OVERVIEW AND OBJECTIVE



5 years
2019-2024



59,9 M€
50 %EC
contribution



116
organisations



17
work packages

20/05/2022

In accordance with the Waste Directive, support Member States in developing and **implementing their national RD&D programmes** for the safe long-term management of their **full range of radioactive waste** taking into account the **various stages of advancement of national programmes**



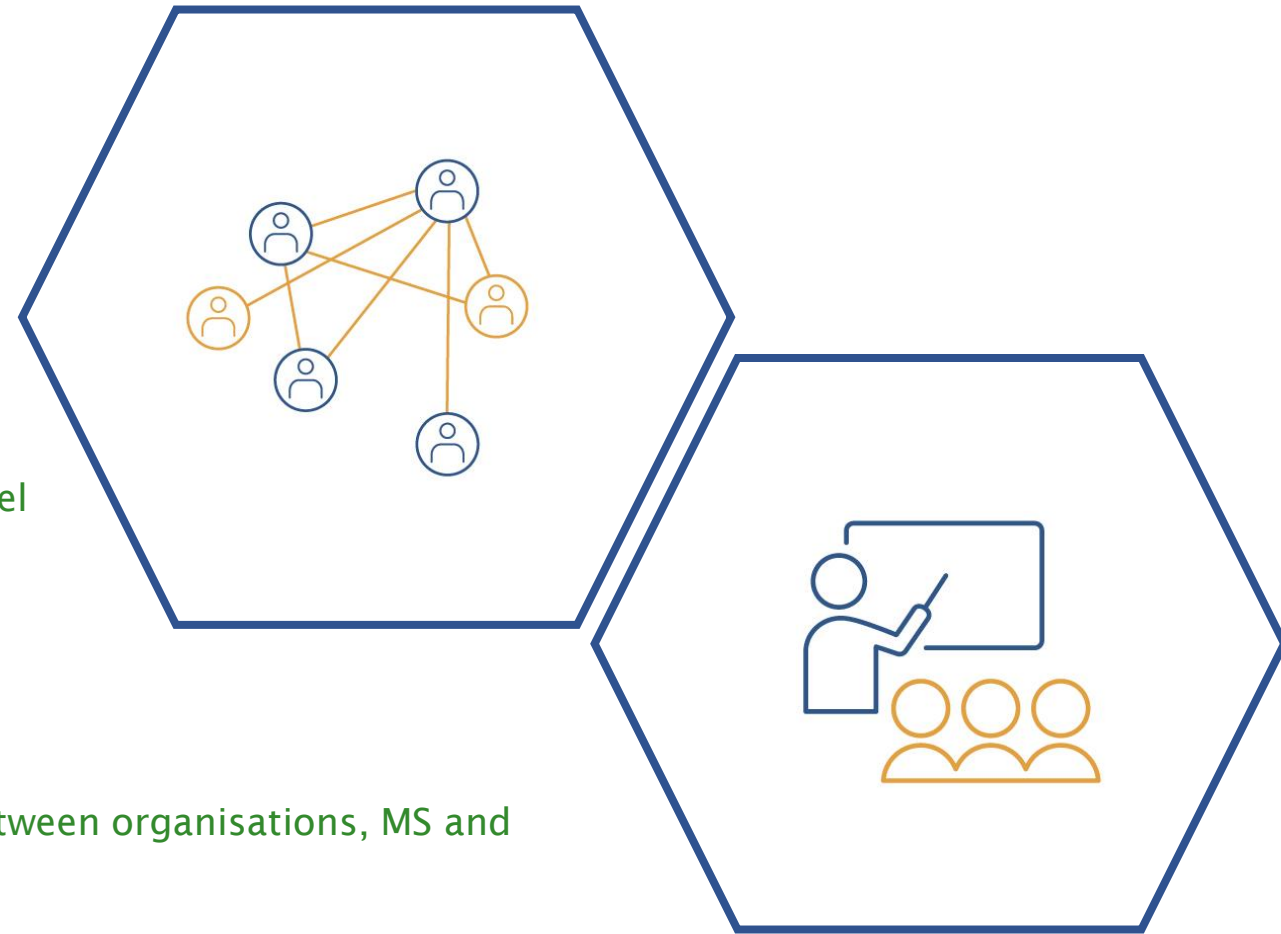
Small inventories : no
nuclear power programme
but medical/research
reactor-derived wastes



Large, complex inventories:
large nuclear power and
defence programmes

EURAD'S AMBITION

- Complement the national Programmes
 - Support compliance with European regulations
 - Foster efficient use of RD&D resources at the EU level
 - Support RWM innovation and optimisation
- Ensure the sustainability of the knowledge
 - Developing and consolidating existing knowledge
 - Enhancing knowledge management and transfer between organisations, MS and generations
- Act as a platform
 - Foster mutual understanding and trust
 - Exchange and cooperation with international organisations and expert networks



EURAD IS A COMMUNITY

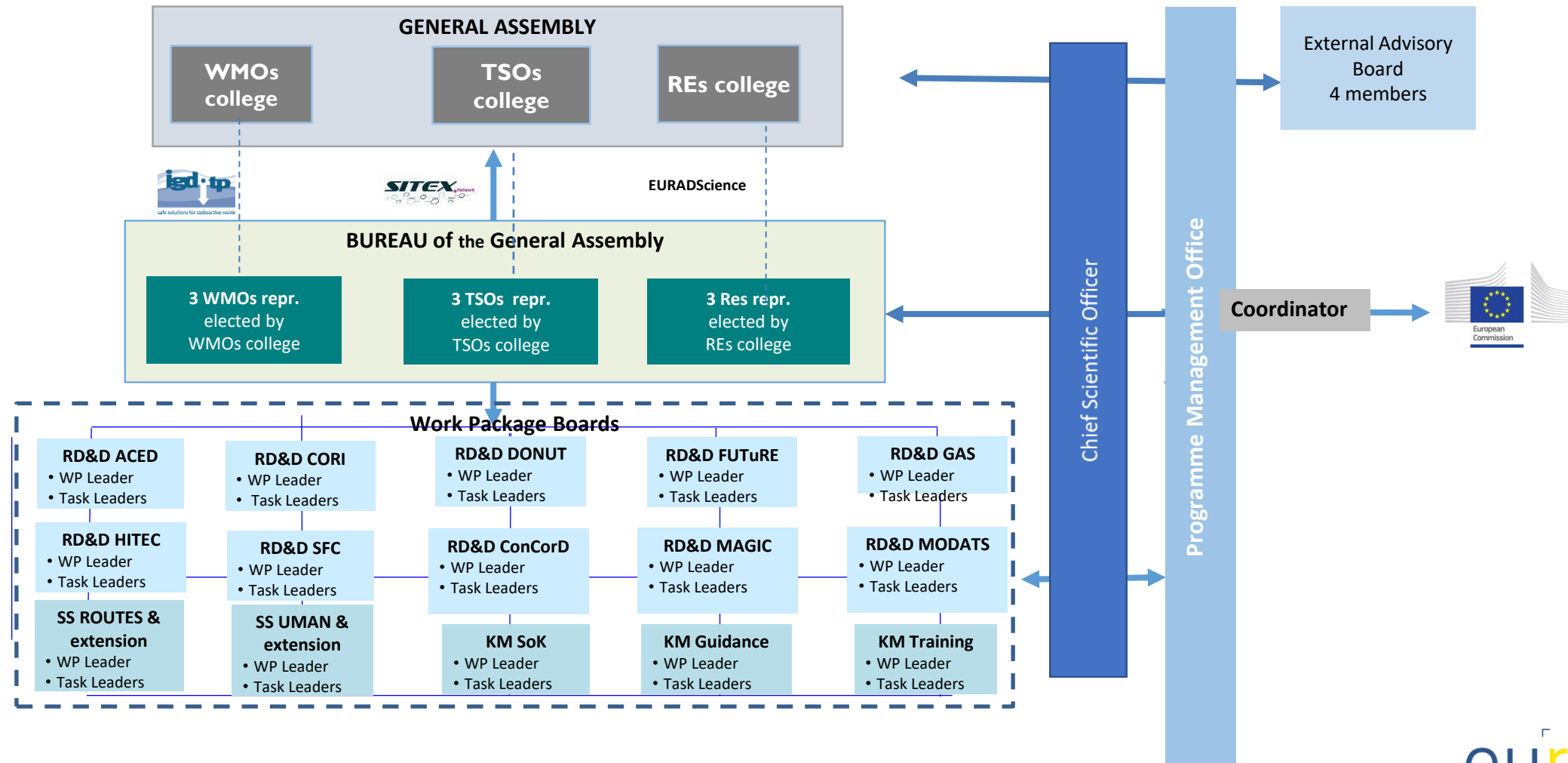
- 51 Mandated actors from 23 European countries representing the following Colleges :
 - Waste Management Organisation (WMO)
 - Technical Support Organisation (TSO)
 - Research Entity (RE)
- 62 Linked Third Parties and 3 International Partners (*CSIRO – Australia, NUMO – Japan and NWMO – Canada*)
- Groups of Civil Society organisations
- 100 registered end users from 21 different countries



Approximately 800 persons involved

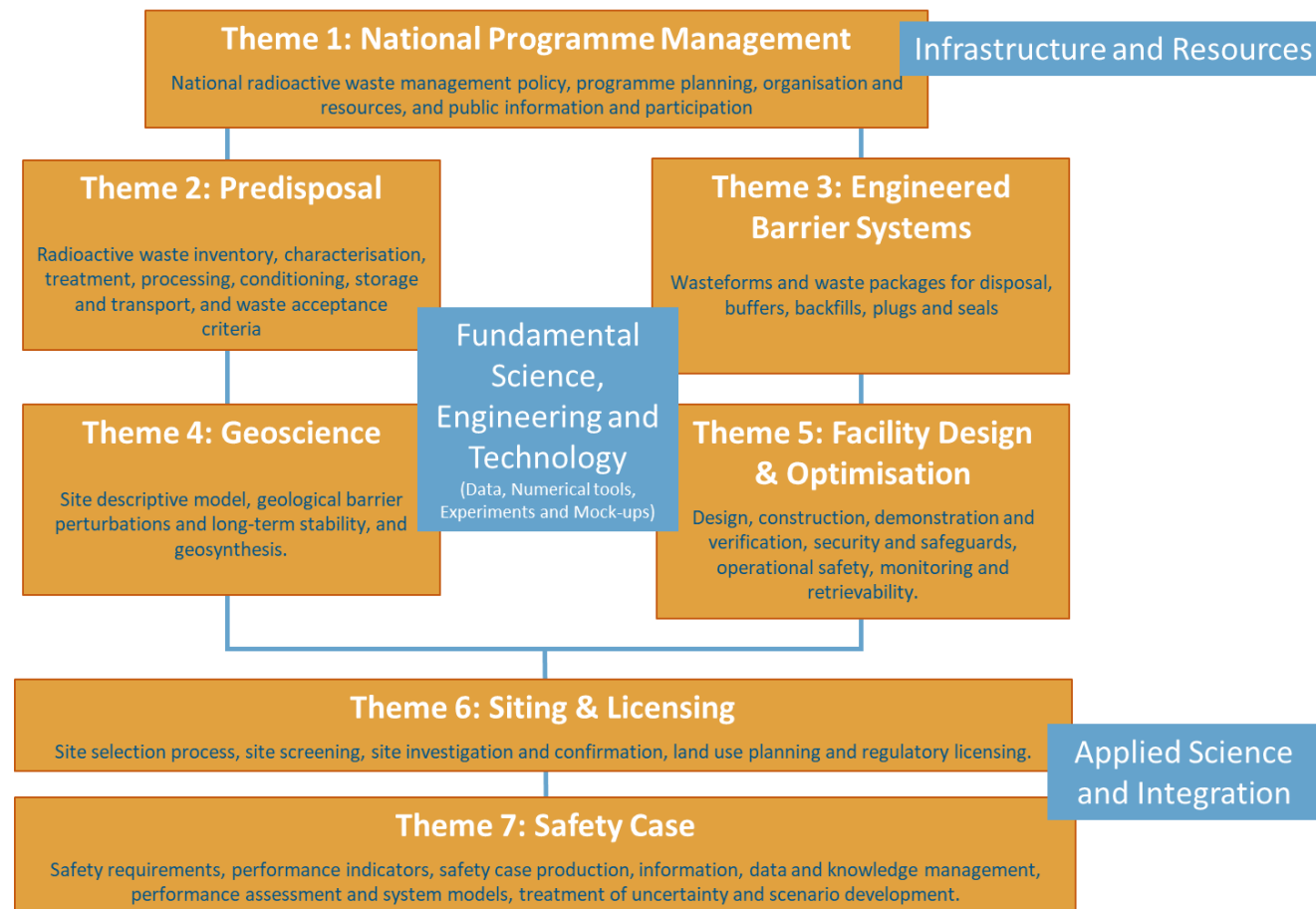


EURAD'S GOVERNANCE

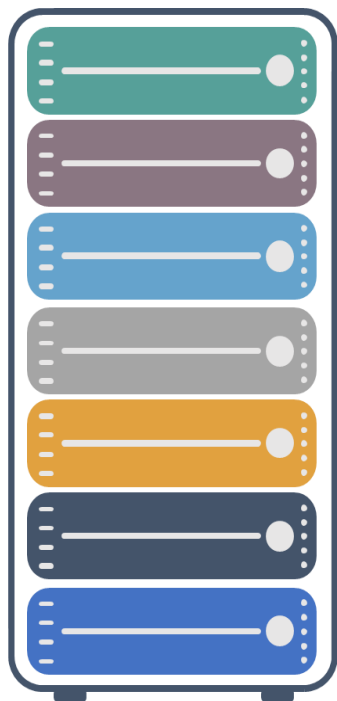


STRATEGIC RESEARCH AGENDA

- 7 overarching themes
- Used as input to define the EURAD work packages
- Shared
- Living and dynamic : allows to include new findings and experience
 - Update underway as an important input for the future EJP
- With a broad spectrum
 - Frames research and knowledge management objectives
 - Covers RWM activities from cradle to grave (does not cover decommissioning)



EURAD ROADMAP



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

A framework based on **goal-oriented breakdown** ...

- to **transfer** existing information & knowledge
- to **assess** existing information & knowledge
- to **identify** needs for **additional RD&D** (→ SRA)
- to **identify** issues to be **collectively explored**
- to **help** achieving clarity on **scope definition**

EURAD ROADMAP – THEME OVERVIEWS



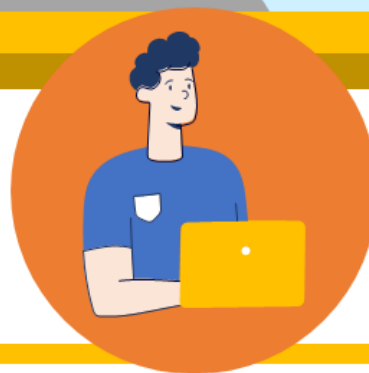
Typical Activities

Describes generically how activities evolve in each Theme.

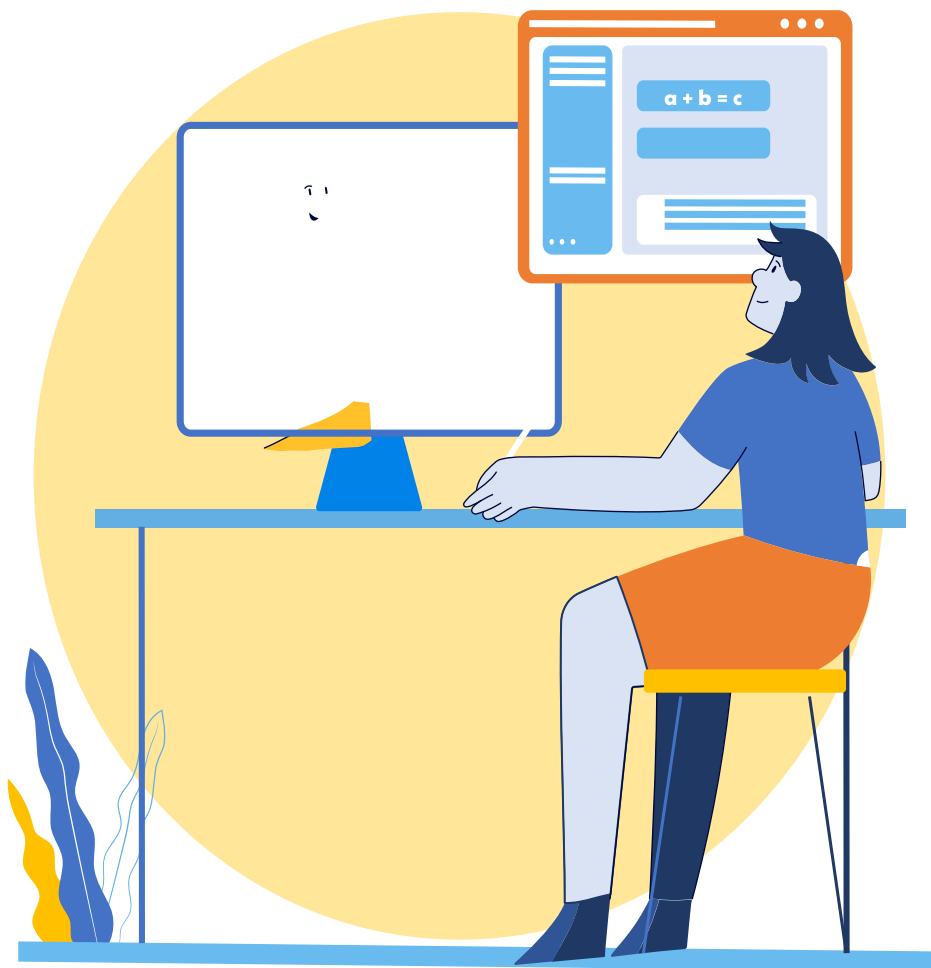


Capability Needs

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.

SCIENCE & NETWORKING –COVERS BROAD SPECTRUM OF ISSUES (12 WPS)

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

- SFC- Spent Fuel Characterization and Evolution Until Disposal
- 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

“Excellent cross-fertilization is achieved among the disciplines, and benefits to all participants.”
Extract EC mid-term review

ADDED VALUE OFFERED BY EURAD – KNOWLEDGE MANAGEMENT

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 & Tools

Connecting people to people, and people to content



KEY ACHIEVEMENTS

○ Scientific excellence

- 6 state of the art
- 80+ publications

○ Support transfer of knowledge

- KM and Networking Programme
- Population of the roadmap
- School of RWM promoting students networking through trainings and mobility
- Production of guidance documents

○ Strategic Research Agenda

- All waste types;
- Pre-disposal & Disposal

○ Foster mutual understanding

- Monthly ‘Lunch-and-learn sessions’
- Lively interactions with international organisations
- Regular exchanges and workshops with civil society

“EURAD also provides a platform for researchers from different disciplines to interact and to learn from other areas what is important for the safe disposal of different types of radioactive waste and for making the safety assessment for these.”

Extract mid-term review report



STATUS AT MID-TERM



RDD& Strategic Studies WPs 'on track'



Strong learning-curve with **Knowledge Management** (a lot of experience with practicalities) and importance of **connection to Roadmap**



EURAD supports & encourages **interaction** between WPs & 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**

“The project, which is very large and has a strong administration is providing excellent results and also provides an excellent platform for all actors involved in radioactive waste management and disposal. The project is step by step becoming one integrated project, instead of a collection of different projects.”

Extract mid-term review

LOOKING AHEAD

“It is important to ensure continuity of the work and the organization built up and be prepared for development of a second step of EURAD, EURAD2, as early as possible.”

Extract mid-term review report

- **Update of the SRA (final version early 2023) will serve two purposes:**
 - Take stock and reflect on progress made since 2019 and capture emerging needs
 - Prepare as guide for a potential future EC joint programme
- Promote **end-user feedback** (member states with their formal bodies, EURAD end-users, ...)
- **'Joint programming' will fulfill expectations of end-users**
 - 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
 - ... and we have developed a joint understanding on the elements of a next EJP



THANK YOU FOR YOUR ATTENTION

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

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