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EURADWASTE '19

9th European Commission Conference on EURATOM Research and Training in Radioactive Waste Management

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European Joint Programme on Radioactive Waste Management

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Background – European RD&D

- For more than 40 years, considerable **scientific and technical knowledge** has been acquired in Europe in the field of radioactive waste management (RWM).
- Through **EURATOM**, EC has supported **EU collaborative RD&D ad-hoc projects** and enhanced coordination by supporting **IGD-TP** platform and **SITEX** network.

SIXTH FRAMEWORK PROGRAMME EURATOM HORIZON 2020 igd-tp safe solutions for radioactive waste SITEX Network

- **Leap forward**: EC Policy & Strategy for **integration of EU Member-States R&D programmes**
  - Replace EU competitive calls for projects by **inclusive European Joint Programmes** (EJP)
- In 2014, EC called for a **feasibility study** of creating such an EJP in RWM field: **JOPRAD** (2015-2017)
  - **identified those actors** with key responsibility for directing RD&D on safe RWM; and
  - engaged them in the development of a **shared Vision** and the basis for a **shared Strategic Research Agenda**

JOPRAD Feasibility study – 2015 -2017

JOPRAD

TSOs identified the aspects of the SITEX SRA that could be included in an European Joint Programme

WMOs identified the aspects of the IGD-TP SRA that could be included in an European Joint Programme

Nationally funded Research Entities identified the aspects of their SRA that could be included in an European Joint Programme

Programme Document

Scientific and technical basis (incl. knowledge management) for a potential EJP.

Scope originally focused on deep geological disposal for spent fuel and high level waste.

Prioritisation according to High, Medium or Low level of Common Interest

www.joprad.eu

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- In 2017, **H2020 EURATOM WP2018** – EC called for the establishment of an **EJP** on RWM (NFRP6)
  - 2017 – 2018: Further development of the founding documents of the EJP on RWM
    - A proposal submitted to EC in September 2018 ; positively evaluated in Feb. 2019
  - **Official launch**: June 2019 !

European Joint Programme on Radioactive Waste Management

The project leading to this application has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 847593.

EURAD Vision and goals

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.

Goals

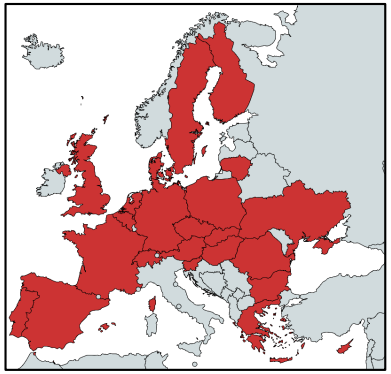
Support the implementation of the Waste Directive in EU Member-States (MS), taking into account the various stages of advancement of national programmes:

- Support MS in developing and **implementing their national RD&D programmes** for the safe long-term management of their **full range of different types of radioactive waste**;
- **Develop and consolidate existing knowledge** for the safe start of operation of the first geological disposal facilities for spent fuel, HLW, and other long-lived radioactive waste, and **supporting optimization linked with the stepwise implementation of disposal**;
- **Enhance knowledge management and transfer between** organisations, MS and **generations**.

EURAD Mandated Actors (Beneficiaries)

Ministries from **23 European countries** (21 Member-States, 2 Associated countries) provided **mandates** to **52 organisations** acting as **Beneficiary** within EURAD, recognising their role of directing RD&D at national level, as:

- Waste Management Organisation (**WMO**);
- Technical Support Organisation (**TSO**); or
- Research Entity (**RE**).



National RWM programmes in Europe cover a broad spectrum of stages of development and level of advancement depending on:

- **National waste inventory**
  - Relatively small inventories (medical/research reactor-derived wastes)
  - Large and /or complex inventories derived from large nuclear power (and fuel reprocessing) and defence programmes
- **national policy and socio-political landscape with respect to long-term management of RW**
  - particularly with respect to plans and national policy towards implementing geological disposal for Spent Fuel, High-level Waste and long-lived intermediate level waste

20 Waste Management Organisations *Whose mission covers the management and disposal of radioactive waste*

13 regulatory Technical Support Organisations *Providing S/T basis for supporting regulators' decisions*

20 nationally funded Research Entities *Working on the RWM challenges under the responsibility of MS*

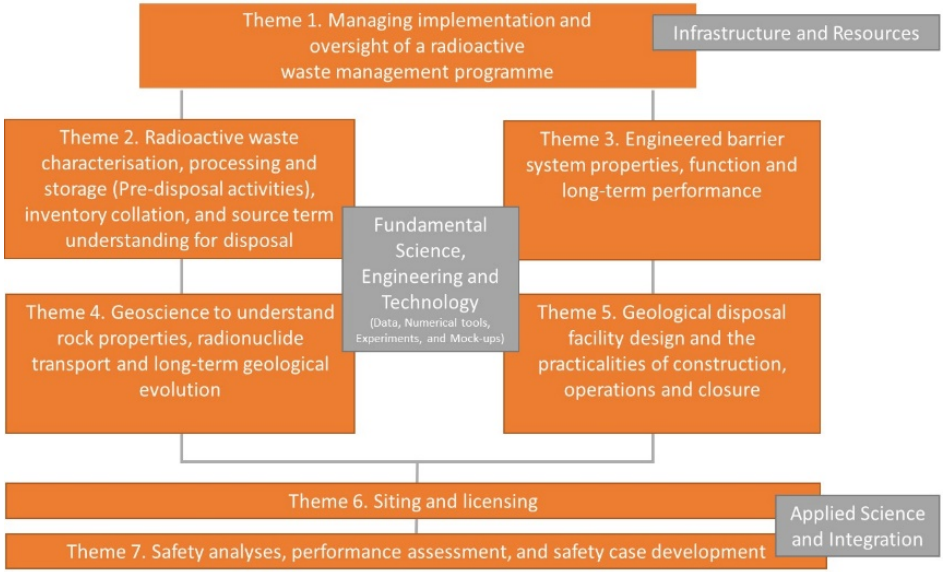
EURAD other participants

- 53 additional organisations (mostly universities and research centres) will also be involved in the implementation of tasks as third parties with a legal link to a Beneficiary (**Linked Third Parties**).
- **Group of Civil Society organisations** such as local communities having interest in RWM (local association, local Committee of Information, local partnership), national or European CS Organisations taking part in interactions in the field of RWM.
- **Waste Producers** and those with a pre-disposal waste management remit are engaged via the NUGENIA association.
  - Although not direct contributors or participants of EURAD yet, continued engagement via dissemination and consultation with NUGENIA will set a foundation for future collaboration in projects influencing the waste form for final disposal.
- **International Organisations**
  - Already EURAD has established close links with IAEA from inception to avoid duplication of effort and resources. Such co-operation will continue, e.g. with the establishment of a Memorandum of Understanding;
  - and extend to other organisations, including OECD-NEA, to strategically direct and offer clear added-value to EURAD objectives.

EURAD Strategic Research Agenda

Scope

- EURAD SRA is a **shared SRA** building on the SRAs of the three colleges of Actors:
  - IGD-TP SRA for WMOs;
  - SITEX SRA for TSOs;
  - RE (EURADSciences) SRA for REs.
- It covers:
  - **All waste types;**
  - **Pre-disposal** - waste characterisation and processing (incl. treatment/conditioning/packaging) and interim storage;
  - **Disposal** - primarily geological disposal, and also other types of disposal
- It does not cover decommissioning
- It is split into **7 scientific themes** (see next slide)
- It is a dynamic and living document that will be regularly updated



EURAD Roadmap

EURAD SRA Themes

Theme 1 - Managing implementation and oversight of a RWM programme

Theme 2 - Waste characterisation, processing & storage and source term understanding for disposal

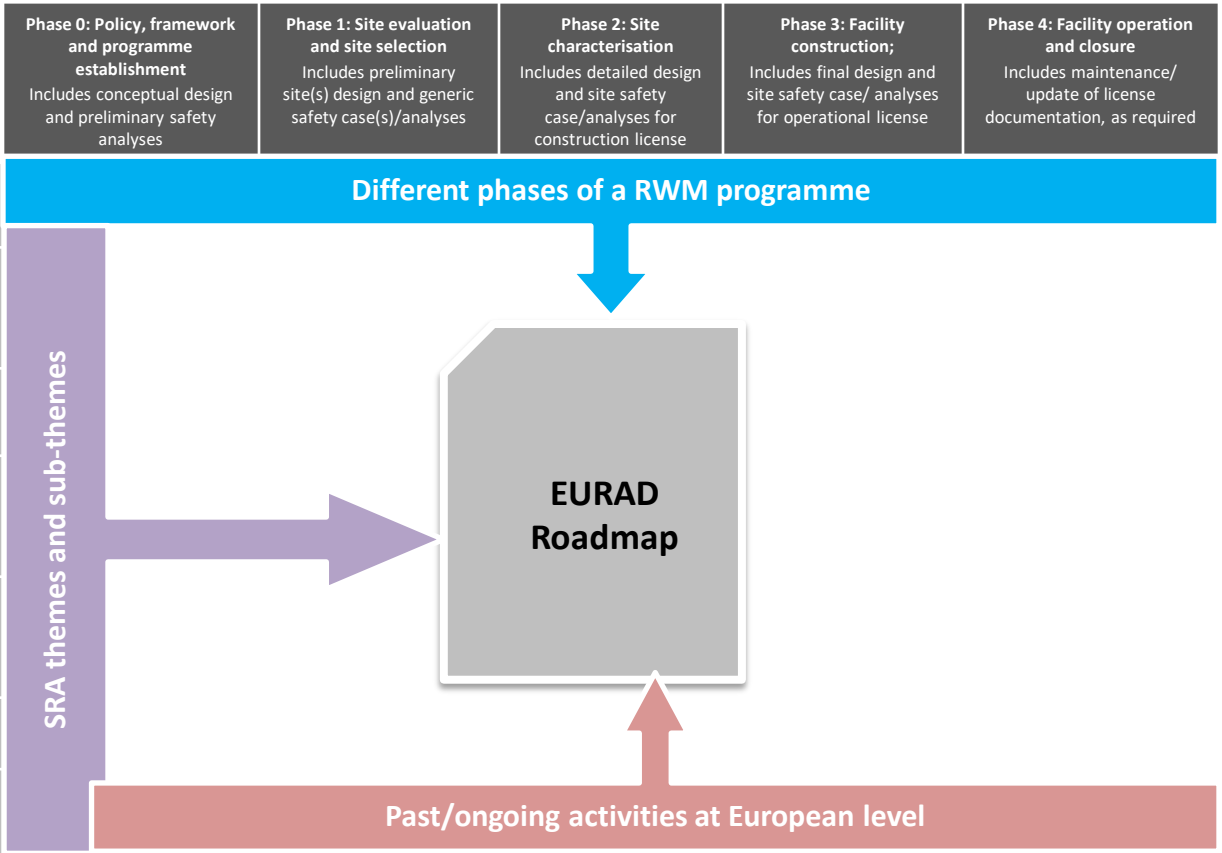
Theme 3 - EBS properties, function and long-term performance.

Theme 4 - Geoscience to understand rock properties, radionuclide transport and long-term geological evolution.

Theme 5 - Facility design and the practicalities of construction, operations and closure.

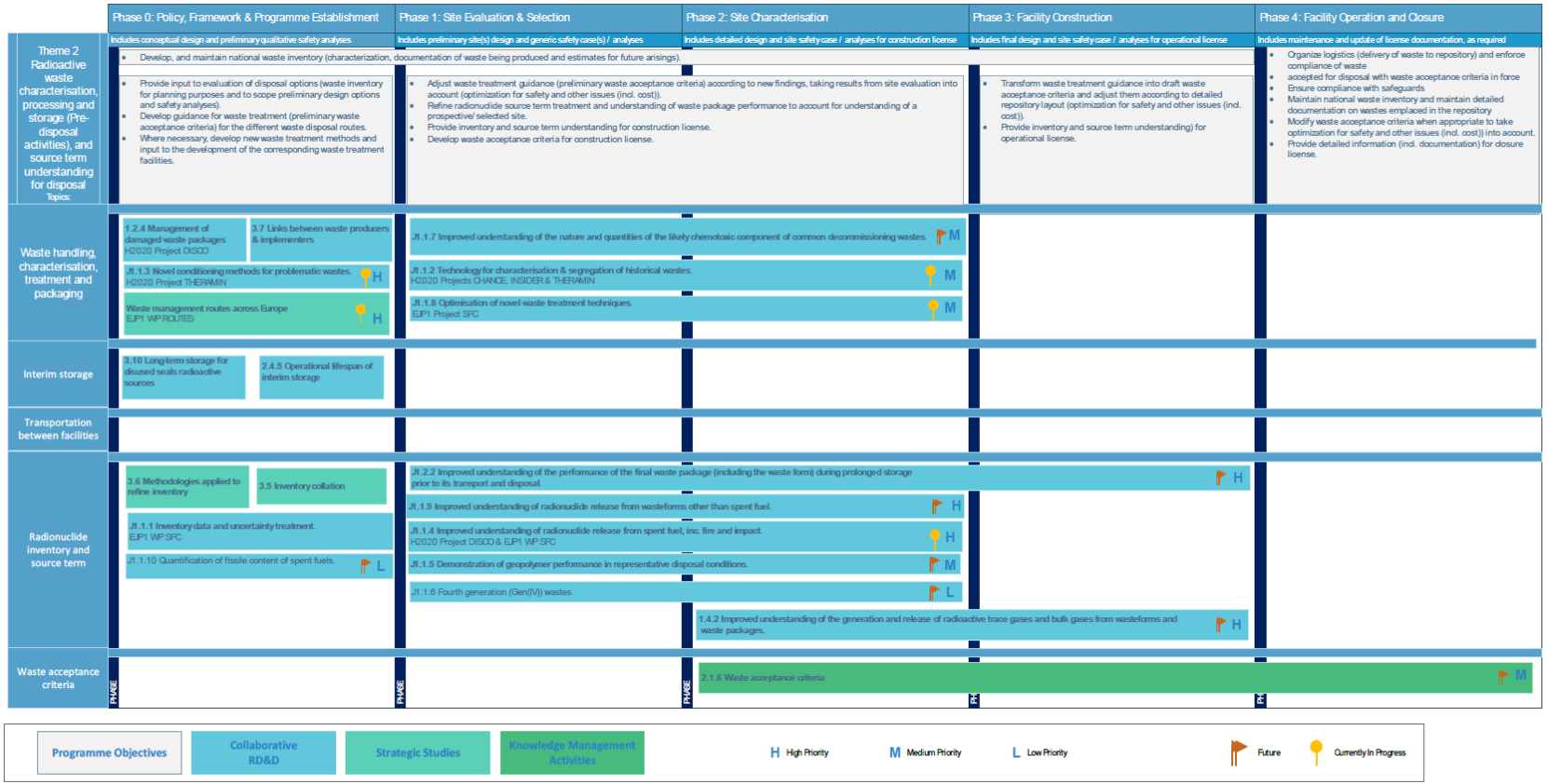
Theme 6 - Siting and licensing.

Theme 7 - Performance assessment, safety analyses and safety case development



EURAD Roadmap (illustration)

Roadmap Theme 2: JP Priorities and Activities of Common Interest that relate to Radioactive waste characterisation, processing and storage (Pre-disposal activities), and source term understanding for disposal

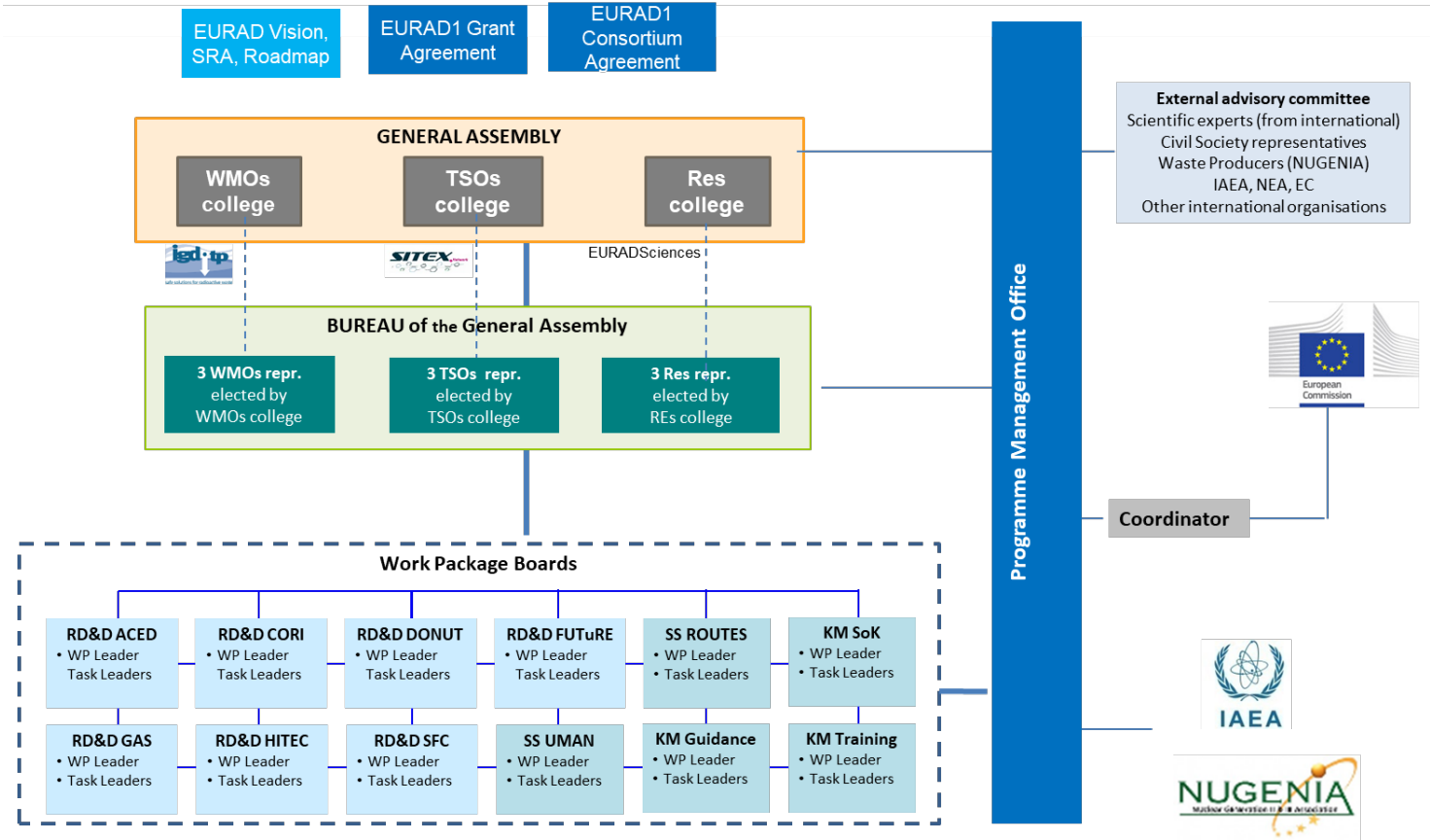


EURAD Deployment Mechanisms

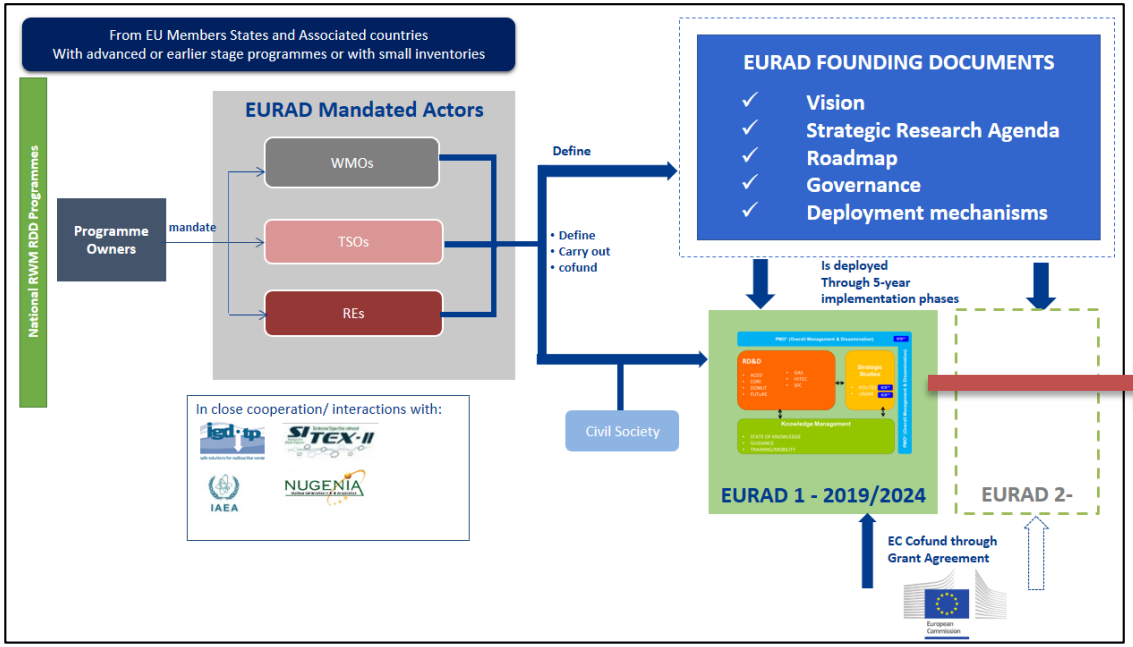
Type of activity	Type of actions	Type of deliverables
Collaborative RD&D	Activities aiming at developing and consolidating scientific and technical knowledge. Activities shall be a balance between those with a direct link to operational RD&D (direct links with implementation and safety of RWM) and prospective RD&D (to demonstrate the robustness of RWM and to maintain scientific excellence and competences).	State-of-the-art (initial and update), S/T deliverables, reports, demonstrator, pilot, prototype, plan designs, software, technical diagram...
Strategic Studies	Actions consisting of enabling experts and specialists to network on methodological/ strategical issues and advance significant challenges that are common to various National Programmes and that are in direct link with scientific and technical issues.	Position paper (e.g. emerging needs for future RD&D/Strategic Studies/KM activities), report on generic methodologies, best practices…
Knowledge Management	Actions consisting of developing State of Knowledge; developing descriptive methodological guidance and developing/delivering Training modules and mobility measure.	State-of-knowledge documents; Guidance documents, Training delivery and materials…
Programme Management	Day-to-day administrative, financial and legal management, reporting, interactions with EC, communication and dissemination activities, Scientific and technical coordination/integration of the overall JP	Management tools, Periodic reports, financial statements, website, platforms…

Cross-cutting component	Actions consisting of implementing EURAD proposed framework for interaction with CS

EURAD Governance

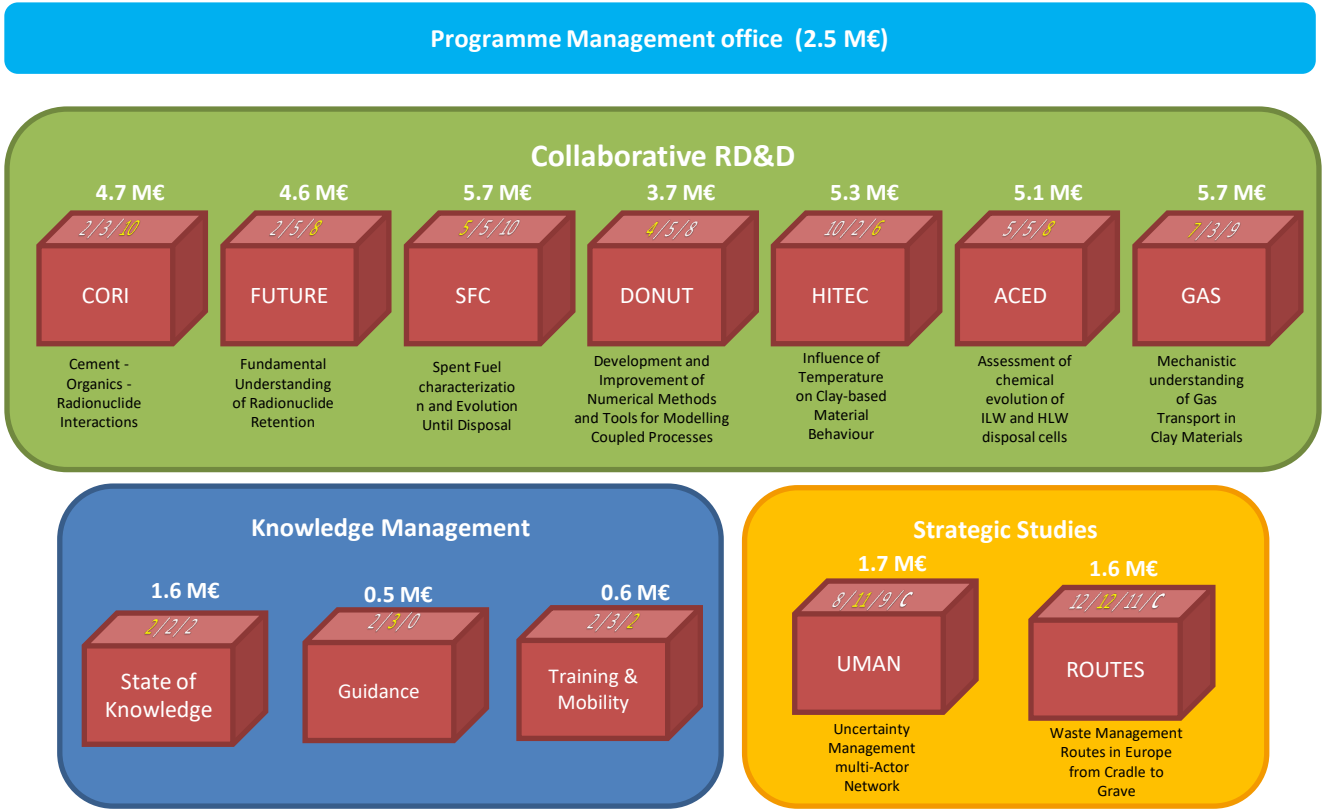


First implementation phase (2019-2024) – EURAD-1



- **Launch**: June, 1st 2019
- **Duration:** 5 years (2019-2024)
- **Resources:**
  - EC EURATOM cofunding: 32,5M€ (Total costs: 59M€)
    - 23,1M€ of EC grant is allocated for a "first wave" of activities 5000 man-months (415 FTE)
    - 9,4M€ of EC grant remains not allocated for a "second wave" of activities (2021)
  - EURAD 52 Mandated organisations embarking 56 Linked Third Parties
    - Total: 108 organisations

First implementation phase (2019-2024) – EURAD-1



Conclusion – Ambition (1/3)

- Fruit of determination, tremendous amount of work from European RWM R&D actors since 2013;
- Establish a **sustainable, inclusive**, **transparent**, **leading-edge scientific** and **goal-oriented**, **entirely new approach on European collaboration towards safe RWM**
  - Sustainable approach particularly pertinent in view of long lead-times & operational time-spans
- **Holistic and multi-disciplinary programme between generations** that shall guide cooperative research and investments in the RWM field over the coming decades in Europe;
  - Predisposal and disposal activities, full range of waste, during all phases of a disposal programme
- Gather **organisations in Europe with key responsibility for directing RD&D on safe RWM irrespective of the stages of development of their national programmes**.
  - Small and early stage programmes are especially strongly involved in the Strategic Studies WP ROUTES and will also benefit from the Knowledge Management programme

Conclusion – Ambition (2/3)

- Implement a **robust & sustained state-of-the-art science & technology programme** established to :
  - complement national R&D programmes for safe long-term management of their full range of radioactive waste,
  - carry out activities of high common interest between the actors where there is added-value at European level.
  - Support research needs of advanced and early stage programmes

- **Elaborate upon complex issues and identify emerging ones** by bringing together all interested actors to jointly conduct Strategic Studies.
  - May be referred to as 'think-tank' activities to determine if there is a RD&D need on an emerging issue, if there is a need of a position paper or if it is considered mature and suitable for knowledge management activities.

- Foster **mutual understanding/trust** between participants and other stakeholders, incl. from Civil Society.

Conclusion – Ambition (3/3)

- **Consolidate efforts across Member-States on Knowledge Management** – this includes:
  - access to existing Knowledge (State-of-Knowledge);
  - guiding the development of capability in line with core competencies (Guidance and Training);
  - improving access to quality tools, resources and communities of practice to share and learn from each other.

- **Deepen the interaction/cooperation** that have been established since JOPRAD with:
  - **Waste Producers** to set the foundation for future collaboration in **predisposal activities** (link with EURATOM Call NFRP10);
  - **IAEA** to avoid duplication of effort/resources and identify possible joint development and implementation of actions
  - Such co-operation shall extend to other organisations, including **OECD-NEA** to strategically direct and offer clear added-value to EURAD.

EURAD – Challenges for Year 1

- **Launch EURAD** and experiment initial learning phase with respect to the governing bodies and mechanisms which may require some fine-tuning.

- **Extend the Roadmap** to support identification of the key need-gaps, which will then be used to prioritise the scope of KM activities:
  - Competency Matrix to identify necessary competencies against Roadmap themes and phases;
  - Mapping of existing/available state-of-knowledge, training, guidances, etc.;
  - Identification of subject matter Experts against each of the Roadmap topics.

- Establish **SOTA reports** of the 7 **RD&D projects** and start implementing the R&D work.

- Initiate the **two Strategic Studies** and start implementing planned work

- **Set the scene** for the launch of the **Knowledge Management** Activities

Thanks for your attention!

Contact:

For further information, please contact

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