European Partnership on Radioactive Waste Management

Small Inventory Member States (SIMS)
Gaps, Challenges and Expectations from EURAD-2

EURAD-2 Annual Event | Bologna, Italy | 9 September 2025

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SIMS group

- **Austria, Croatia, Cyprus, Denmark, Estonia, Greece, Ireland, Latvia, Malta and Portugal.**
- SIMS definition in the ROUTES WP differs from the one adopted for this group, which focuses on MS without nuclear power plants or high-level waste, but still manage small inventories.
- While the ROUTES definition is more inventory-based (and could include countries like Slovenia, the Netherlands or Poland), the intent is to provide a platform for those **MS without dedicated forums to address their unique challenges**.
- An inclusive approach for all MS with small inventories is supported. **The focus remains on issues not related to NPP waste.**

Euratom (RTD-ENER-JRC) event dedicated to RWM in SIMS | 22 October 2024

- Implementation of the Waste Directive and other on-going studies on RWM
- The Euratom R&T programme and the Partnership on Radioactive Waste Management
- An overview of the JRC role and activities in RWM, infrastructures and training capacities
- Needs and challenges of the small inventory and early-stage MS
- Capacity and competence building
- The way forward

- Dedicated session on addressing:
  - The current situation regarding RWM in SIMS.
  - The status of reporting on the RWD implementation.
  - The needs and challenges in managing RW, particularly with respect to RD&D, and skills / competencies (where applicable).

Generic common issues and challenges (identified in October 2024)

- Political commitment
- Institutional gaps, limited resources, shortage of staff, lack of specialised qualified staff
- Integrated waste management approach
  - SMR, decommissioning, medical isotopes, legacy waste
- Challenging waste streams
  - NORM, Research reactors, Disused sources (sealed, orphan, non-sealed)
- Specifically tailored disposal solutions (e.g. borehole) - EC initiatives: Shared solutions for predisposal and disposal
- Predisposal operations (e.g. characterisation, conditioning, transport)
- Skills, training and competences
- What knowledge can be transferred from LIMS to the SIMS? Harmonising the way of reporting on RWD implementation?
- Committing resources considered as challenging
- Agreed to explore ways of working together and exchanging information that wouldn’t be a burden

SIMS Survey (early 2025)
Preliminary Findings and Next Steps

Participation Overview

- 15 responses received from 11 Member States
- Broad geographic coverage within the EU. Relatively balanced representation of the three colleges (6 WMO, 6 TSO and regulators, 3 RE)

Interest Areas

- **ASTRA, SUDOKU, ICARUS, and STREAM** are the four WPs that attracted the most interest from SIMS, with Work Package 3: ASTRA (Alternative RWM Strategies) (14/15) being unanimously selected.
  - ASTRA High interest expressed in Followed by SUDOKU (9/15), ICARUS (6/15) and STREAM (5/15)
  - Other key areas of interest: Safety cases, Disposal concepts, Knowledge Management
- This clearly highlights the importance of including predisposal topics and alternative disposal solutions in the future Work Packages to address SIMS' needs

SIMS Survey (early 2025) | Key Needs and Suggestions

Key Needs and Suggestions

- Desire for guidance on:
  - New EU regulations related to radioactive waste
  - International disposal concepts and cross-border collaboration
  - Knowledge transfer to small inventory countries
- Suggested EURAD-2 outcomes:
  - Practical training courses, webinars, and Lunch & Learn sessions
  - Continued opportunities for small Member States to actively contribute
- Overall positive feedback on current EURAD-2 scope, with room for additional targeted support

SIMS Virtual Meeting | 9 July 2025

- Key topics discussed:
  - The future direction of the SIMS group
  - Appointment of a spokesperson to represent SIMS at relevant upcoming events
  - Preparations for the current EURAD-2 Annual Event (Sept 2025)
- Official end-user registration on the EURAD website
- Nomination of a SIMS spokesperson (to represent the SIMS group and act as a liaison with the Bureau, PMO and the wider EURAD community)
- Feedback and review of key deliverables (for instance, some WPs such as ASTRA are of broad interest to the SIMS community)
- Position paper (long-term) to articulate SIMS priorities, needs and feedback on EURAD's work
- Second-wave Work Package proposals
- Designating SIMS representatives to the Annual Event – Input for SIMS sessions at the Annual Event
- Future annual events aligned with the rotating Presidency of the Council of the EU

SIMS Survey (August 2025)

Participation Overview

- 6 responses received (until 5 September 2025) from 5 Member States
- Restricted participation, although broad geographic coverage within the EU could be considered (Austria (2), Cyprus, Denmark, Estonia, Greece).

Interest Areas

- Main interest for WPs: KM, ASTRA, SUDOKU, HERMES, ICARUS, STREAM, CLIMATE…
  - Other key areas of interest: Safety Case Development, Site Selection, Public Engagement, Modeling (Disposal Facility and Environment), Toxic / chemical substances, …
  - Interest in providing guidance on characterisation, documentation, safety analysis, long-lived radionuclides, etc.
- Again, the survey highlights the importance of including predisposal topics and alternative disposal solutions in the future Work Packages to address SIMS' needs

SIMS Survey (August 2025) | Challenges (1)

- List the most important challenges you face in the implementation of your national radioactive waste management programme, providing specific examples if possible.
  - In some cases, absence of local disposal solution (e.g., near-surface and deep-geological)
    - **Resources challenges** (e.g. overall cost, financial sustainability as compared to the limited – current and anticipated – inventory)
    - **Social and political challenges** (e.g. planning duration, decision-making, public and political opposition)
    - **Technical and regulatory challenges** (e.g. lack of experience and competence, implications in establishing a concrete national programme)
    - **Could shared peripheral solutions be the answer to this challenge? There is a need to extend international dialogue on international disposal concepts and cross-border collaboration.**
  - In some cases, absence of infrastructure for conditioning RW
    - Inability to stabilise waste, reduce volume, encapsulate or even decontaminate waste. For instance, as concerns DSRS, the volume of decommissioned lightning conductors can be dramatically decreased by removing the radioactive sources and by decontaminating the remaining metallic parts.

SIMS Survey (August 2025) | Challenges (2)

- List the most important challenges you face in the implementation of your national radioactive waste management programme, providing specific examples if possible.
  - Establishing Safety Criteria, Waste Acceptance Criteria and Site Selection Criteria
  - Identifying an appropriate level of detail and methods for waste characterisation
  - Managing legacy waste, NORM, chemical or toxic substances, etc.
    - For instance, for low NORM volumes, investing in volume reduction is more expensive than near-surface disposal.
  - Lack of a national institution with deep technical capacity (TSO?). Resources must be expanded to support safety assessments, long-term safety cases, R&D, public communication and participation and institutional support for the competent authority ➡ Results in relying to regular external contracting or dependence on foreign expertise.
  - In some cases, absence of national R&D on RW / DSRS management
  - Further guidance is needed on specific aspects of implementation of the national programme, e.g. financial estimates for the management of RW and DSRS covering existing and future needs

SIMS Survey (August 2025) | Challenges (3)

- List the most important challenges you face in the implementation of your national radioactive waste management programme, providing specific examples if possible.
  - Resources (e.g. human, infrastructure, allocated funds, knowledge) are limited
    - Capacity-building activities are sporadic and non-systematic
    - Reliance on external support, frequent utilisation of external capacity-building opportunities, e.g. by IAEA
    - Retaining and transferring knowledge in a SIMS country remains a challenge
    - Securing financial resources for future disposal solution, in the absence of long-term management solution
    - Staff to deal with RD&D, implementation of a disposal, safety assessment, simulation, etc. not available
  - Public engagement and transparency
    - Building public trust is essential, e.g. as related to site selection or environmental impact assessments for future facilities.
  - Political commitment. Not deferring decisions in future.
    - Decision making: e.g., no decision on disposal type, role definitions and responsibilities among all key actors not yet defined, no decision on site selection process

SIMS Survey (August 2025) | Challenges (4)

- List the most important challenges you face in the implementation of your national radioactive waste management programme, providing specific examples if possible.
  - Introducing a structured management system to support the national RWM framework, tailored to country's specific needs and circumstances
  - Data management
    - Introducing an inventory model enabling transparent and consistent data management across various sources, ensuring traceability and reliability across the database
  - Regulatory complexity and stakeholder coordination
    - Complex regulatory environment, encompassing national legislation, EU directives and IAEA requirements. This requires coordination among multiple authorities and ministries. There is a need for a clear governance structure, enhance coordination and clarify roles and responsibilities among stakeholders.

SIMS Survey (August 2025) | How can EURAD-2 help (1)

- Describe how EURAD-2 could help in the implementation of the national RWM programme. Point out any Work Packages that might specifically be useful to you or any gaps/needs that would like to be addressed.

General observations

- Some institutions / countries have already registered as EURAD-2 end-users
- EURAD-2 an excellent opportunity to address SIMS technical issues
- Some States reported that they already benefited from international exchange within EURAD-2
  - The project covers their current and relevant topics of interest
  - Important to make appropriate use of EURAD-2 provided training activities
- EURAD-2 work should remain pragmatic, exploring realistic approaches which could address current concerns and have practical use for both SIMS and other countries.

SIMS Survey (August 2025) | How can EURAD-2 help (2)

- Describe how EURAD-2 could help in the implementation of the national RWM programme. Point out any Work Packages that might specifically be useful to you or any gaps/needs that would like to be addressed.

Specific observations

- Support in establishing a (or revising the existing but inadequate) national R&D programme
  - EURAD-2 (e.g., via WP3 – Alternatives RWM strategies (ASTRA)) can provide a framework for supporting the development of a national R&D roadmap aligned with EU-wide priorities, supporting SIMS in initiating a basic own-run research programme
- Capacity-building and knowledge management
  - Access to EURAD-2's systematic training, guidance documents and knowledge preservation tools (e.g., via WP2 – KM) could help overcome challenges in sustaining expertise, especially in the absence of a national TSO and limited national resources
- International collaboration and shared long-term solutions
  - Participation in dialogue on international or shared disposal options for RW/DSRS (e.g., borehole disposal or regional repositories) would help SIMS explore alternatives based on realistic, sustainable options
  - Hopefully WP14 – Near-surface disposal optimisation based on knowledge and understanding (SUDOKU) and WP3 – ASTRA could offer a platform for SIMS to share experiences and examine adaptable long-term models from other MS

SIMS Survey (August 2025) | How can EURAD-2 help (3)

- Describe how EURAD-2 could help in the implementation of the national RWM programme. Point out any Work Packages that might specifically be useful to you or any gaps/needs that would like to be addressed.
  - Foresee to gain knowledge from LIMS. For instance, in clarifying roles and models of governance (e.g., via WP3 – ASTRA and WP2 – KM)
    - Lessons from EU countries on structured cooperation between RAs and WMOs could inform legal and institutional arrangements in a SIMS country, helping to address the current challenge in formal RA and WMO / TSO cooperation
    - WP3 covers system-level analysis and strategic planning, which may include roles of stakeholders and institutional cooperation frameworks, especially when evaluating different national strategies
  - Financial planning and disposal costing (e.g., via WP3 – ASTRA and WP14 – SUDOKU)
    - EURAD-2 can assist in building scenarios and cost estimations for RW / DSRS management and disposal, taking into account technical feasibility, regulatory constraints and financial implications of different strategies
    - Can support understanding the cost impact of long-term storage vs. disposal, compare in-country vs. shared disposal models and the development of realistic financial provisions in the absence of a defined long-term solution
    - Can help SIMS explore and model costing of interim storage, long-term storage or eventual disposal

SIMS Survey (August 2025) | How can EURAD-2 help (4)

- Describe how EURAD-2 could help in the implementation of the national RWM programme. Point out any Work Packages that might specifically be useful to you or any gaps/needs that would like to be addressed.
  - Networking and peer review opportunities (e.g., via the whole EURAD-2 Community and WP2 – KM)
    - Involvement in EURAD-2 provides access to shared EU knowledge, tools, and experiences, EU-level peer exchanges and good practices, which can guide SIMS in adapting their national strategy despite their small inventory and resource constraints
    - Participation in organised community events, twinning arrangements, peer reviews, workshops, training and technical exchange workshops
    - Benefit from capacity-building efforts, including targeted support to less advanced programmes
  - Providing guidance as concerns characterisation of waste; NORM; frameworks for structuring national waste programmes and aligning with EU standards and data quality protocols developed across Europe; governance and coordination models for multi-stakeholder environments; approaches to stakeholder dialogue and trust-building.
  - Providing assistance in mapping and carrying out gaps analysis to summarise challenges and best practices for NORM management in SIMS.

European Partnership
on Radioactive Waste Management

Thank you