



## POSITION PAPER ON EURAD - 1

# EURADSCIENCE

### EURADSCIENCE: aim and vision

EURADSCIENCE is the first international network of research entities established to unite the work of national research organisations on radioactive waste management from cradle to grave, and to drive scientific excellence in the field over the next decades to come. The EURADSCIENCE network links research-oriented organisations to EURAD, the 1st European Joint Programme on geological disposal of radioactive waste, and supports the Research Entities College within the EURAD governance structure. Furthermore, EURADSCIENCE was at the basis of the new EC-funded PREDIS project, which will launch on 1 September 2020 and focus on best practices and predisposal management breakthroughs for radioactive waste. As an independent, cross-disciplinary and fundamentally inclusive organization, our aim is to ensure long-term scientific excellence and credibility during the whole chain of radioactive waste management, irrespective of national implementation status, waste type characteristics or national inventory. **Our vision is to maintain a holistic view of relevant scientific disciplines, to provide scientific excellence to advance the progress of national radioactive waste management programmes, and to assure scientific credibility and by this contribute to societal acceptability of waste management concepts.**

### EURADSCIENCE: Aim and purpose of our position paper on EURAD -1

This first EURADSCIENCE position paper is intended for the EURAD community. It emphasizes several critical points the EURADSCIENCE network wishes to articulate with respect to some fundamental and strategic choices EURAD is facing. The primary aim of this paper is to clarify our position and to inform discussions with the WMO and TSO Colleges, in order to ensure EURAD's strong foundations continue to be based on common understanding of the needs in European waste management research in the years to come.

## EURADSCIENCE view on EURAD

EURAD is a first-of-a-kind joint research and knowledge management programme on radioactive waste management, guided by a long-term vision shared by national Waste Management Organisations (WMOs), Technical Services Organisations (TSOs) and the wider scientific community. While WMOs are responsible for the safe implementation of national radioactive waste disposal projects and TSOs support the regulation of such projects, the research community supported by EURADSCIENCE is responsible for developing scientific knowledge necessary for the successful implementation of these projects, thereby innovating and optimising the whole chain of radioactive waste management processes (both pre-disposal and disposal). But EURADSCIENCE carries as well the wider-reaching societal mission of assuring scientific leadership of the involved research community, and the scientific credibility of the waste management projects, providing scientific and technical expertise and excellence in light of the ever-advancing state of knowledge over the many tens of years of project operation until repository closure. At the same time, research organisations seek novel solutions based on the latest scientific knowledge and state-of-the-art developments with game-changing potential, such as novel demonstrations of repository long-term safety, development of novel waste management technologies that can solve challenges associated with “problematic wastes”, or novel repository barrier materials with significantly improved function and/or lower cost. Objective and independent science allows WMOs and TSOs to make informed decisions and to implement solutions based on best available knowledge, while being aware of knowledge gaps and limitations.

**EURADSCIENCE therefore fully supports the founding principles and vision of EURAD, which can be summarized as being based on three pillars: ‘safety’, ‘implementation driven’ and ‘scientific excellence’.** These three pillars, acting together, reflect the interplay between the three Colleges involved in EURAD, and EURADSCIENCE recognizes and actively supports the balance that is needed between the Colleges, and between these three pillars, which makes EURAD, and by extension any waste management programme, a success.

Within EURAD, the common denominator between the three Colleges, and, indeed, between the three central pillars is the Strategic Research Agenda (SRA), driving the research-centered work packages. EURADSCIENCE upholds the agreement made between the different Colleges to arrive at a common SRA, and judges that the SRA strikes a good balance between safety, scientific excellence, and implementation. In our common update of the SRA, EURADSCIENCE intends to identify and focus on those areas that are under-explored instead of focusing on refining established concepts.

EURADSCIENCE supports multi-disciplinary membership of the EURAD Advisory Council as proposed by the EURAD PMO, and would like to see at least one member with a high achievement in the field of radioactive waste management and recognized as having a wide-ranging vision of the field.

## EURADSCIENCE view on knowledge management within EURAD

EURADSCIENCE recognizes that the EURAD Knowledge Management programme provides a significant challenge, and is a key part of the step change EURAD is striving for, compared to previous EURATOM research projects. **EURADSCIENCE emphasises that research organisations, apart from their focus on scientific excellence, have specific missions, capabilities and competencies, including exercise of leadership on knowledge management:**

- Research organisations own unique infrastructure including underground research laboratories and specialized nuclear facilities allowing work on highly radioactive substances. EURADSCIENCE stresses that such facilities should remain available, accessible and well maintained. We encourage discussions of how EURAD can support these unique infrastructures to help them remain sustainable in the long term. Such infrastructures should be a fully integrated component of the EURAD training and mobility work packages.
- Research organisations are generally recognized as national or international centres of expertise, receiving investments and funding from government and international agencies, sometimes with special statutory missions related to their scientific fields of expertise, and providing specialized training for all actors within radioactive waste management.
- Research organizations function and progress in a spirit of peer review of obtained results to allow for the objective advancement of science and knowledge. Publication in peer-reviewed journals has so far proven to be the most important, durable and robust form of transfer and advancement of knowledge. This also exemplifies that knowledge is constantly evolving, and solutions should be credible at the time they are implemented.
- Research organisations are prime players and have huge expertise and a long history in knowledge transfer. They have been and will continue to be responsible for educating and training the next generation of radioactive waste management experts through contributing to PhD and MSc programmes.

The above points show the central role research organisations play within radioactive waste management knowledge and competence preservation, transfer and further development. Libraries or document management warehouses may be useful tools for making knowledge accessible, but EURADSCIENCE does not consider that knowledge management mechanisms can be limited to production of paper or databases. EURAD should actively develop mechanisms and support good practice allowing transfer of capabilities and competences, making use of unique facilities the EURADSCIENCE community has at its disposal for performing state-of-the-art science.

EURADSCIENCE encourages all EURAD actors to support programmes that allow young researchers to become involved in radioactive waste management, including on topics that are mainly of longer-term interest, as these young researchers will be the driving force for future implementation of optimized waste management solutions. We welcome also WMO and TSO input

during training of these young researchers. We support all initiatives taken to maintain, update and modernize our critical and unique facilities as their existence contributes to long-term knowledge management.

Regarding the expert role in the EURAD work package on State of Knowledge (SoK), EURADSCIENCE is ready to support all experts who have gained practical expertise and/or have a publication record, as those experts have gained great benefits from learning by doing, and can therefore make more informed judgements about critical points within their area of expertise. Being selected as an expert should be seen as an honour for both the person and the organisation. It is important that chosen experts express the wider views of the scientific community, and highlight controversial aspects/identify open aspects.

### **EURADSCIENCE view on inclusiveness towards the whole EURAD research community**

EURADSCIENCE is open and inclusive to EURAD Mandated Actors, Linked Third Parties and other actors who identify themselves as research organisations within the European radioactive waste management landscape and who aim to excel within their given field of expertise. EURADSCIENCE intends to extend its network by engaging research entities across Europe and beyond that have the potential to contribute to fulfilment of the SRA. In this regard, EURADSCIENCE could benefit from the active support of WMOs and TSOs who, through their networks, can guide potentially interested organisations to EURADSCIENCE in order to allow our network to be fully inclusive and to allow EURADSCIENCE to represent the full spectrum of competences and expertise needed to realise the EURAD vision.

### **EURADSCIENCE view on EURAD 2nd wave activities**

EURADSCIENCE strongly supports those research topics where scientific excellence and advancement is key and embedded at the roots of the proposed work packages. Novel approaches and techniques showing innovation potential on shorter term and longer term should be actively promoted within those topics selected for the EURAD 2nd wave.

EURADSCIENCE also promotes projects enabling establishment or strengthening of communities of practice not covered by existing EURAD (or PREDIS) work packages, allowing EURAD to become a platform where experts from different scientific disciplines can meet, discuss, exchange ideas, and move science forward in a holistic view on best waste management practices.