

ADDRESSING CHALLENGES IN THE NUCLEAR FUEL CYCLE BACK-END: NEA'S COMPREHENSIVE APPROACH

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The NEA Radioactive Waste Management Committee (RWMC) and Committee on Decommissioning of Nuclear Installations and Legacy Management (CDLM) provide an established framework for addressing key challenges in the back end of nuclear fuel cycles. The holistic approach of RWMC and CDLM integrates environmental and operational safety, economic considerations, societal impacts, and regulatory frameworks. These committees continuously adapt to the evolving needs of NEA Member Countries over time to tackle complex challenges while prioritizing safety and sustainability. Based on these needs, key focus areas now include information, data, and knowledge management (IDKM), regulator-implementer dialogue, and the practical applications of robotics and advanced technologies in the back end of the nuclear fuel cycle. Relevant publications such as the “*IDKM Roadmap*” and the forthcoming “*Roadmap for regulator-implementer dialogue in the pre-licensing phase of DGR programmes*” reflect this progress. Additionally, major events are planned for 2025, including the *NEA Workshop on the Role of Innovation in the Nuclear Back-End* (Workington, UK, 1-3 April 2025) and the *NEA Symposium on Information, Data and Knowledge Management for Radioactive Waste and Geological Disposal* (Yokohama, Japan, 7-10 October 2025). Looking ahead, a new expert group on storage and transportation is being established following the conclusions of a workshop held in the USA in December 2023. The NEA is actively exploring the implications of Small Modular Reactors (SMRs) and Generation IV technologies for the back- end through dedicated workshops in 2022-2023, topical sessions in 2024, and a new focus group to advise the RWMC and CDLM on these issues. Beyond committee activities, the NEA Joint Projects offer an additional mechanism to implement international co-operation on specific areas of common interest. Upcoming initiatives include the *Waste Integration for Small and Advanced Reactor Designs (WISARD)* project, which will assess the compatibility of spent fuels and waste streams generated by new reactor technologies with existing waste management solutions. Key focus areas for WISARD encompass spent fuel and waste characterization, storage, transportation, long-term disposal, and treatment and recycling. Additionally, the *Multinational Infrastructure for Managing Radioactive Waste (MIRA)* project will focus on shared facilities for treatment, storage, and disposal, along with enabling conditions such as transportation, financing, and legal and regulatory frameworks.

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