# Building Nuclear Talent: Integrating Education, Industry and International Cooperation

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## ABSTRACT

The development of a sustainable, highly skilled and adaptable workforce represents a strategic priority for the European nuclear sector, particularly in the context of long-term operational sustainability, nuclear refurbishment and lifetime extension programs, technological innovation and new nuclear developments. Addressing current and emerging workforce challenges requires a coordinated and forward-looking approach that strengthens cooperation between industry, education and training providers, and international stakeholders, while ensuring that skills development pathways remain responsive to evolving sectoral needs.

This paper presents Societatea Nationala Nuclearelectrica's (SNN) integrated approach to nuclear workforce development, bringing together academic engagement, vocational education and training (VET), work-based learning and international cooperation within a coherent strategic framework. The approach builds on structured partnerships with higher education institutions and VET providers, dual education programs, scholarships, internships, STEM outreach activities and specialized technical workshops. Collectively, these initiatives aim to strengthen the education-to-employment transition, enhance the attractiveness of nuclear careers and support the development of competencies aligned with industry requirements.

The paper's methodological contribution lies in the application of SNN's Academic Engagement Indicator as a performance-based management tool for systematically monitoring educational initiatives, assessing progress against strategic objectives and supporting evidence-informed decision-making. This approach

provides a structured basis for evaluating institutional engagement, identifying opportunities for improvement and strengthening the alignment between educational activities and long-term workforce development priorities.

The analysis further examines the strategic complementarities between SNN's national initiatives and international cooperation frameworks, including *Skills4Nuclear*, *Towards Skills4Nuclear Academy* and the proposed *NuclEUs Centre of Vocational Excellence*, ENEN-related initiatives, and the FIRST initiative supporting Romania's *National Roadmap for Development of a Capable Nuclear Workforce*. These initiatives offer complementary perspectives on skills intelligence, competence gap identification, vocational excellence, knowledge exchange and the alignment of national education and training capacities with European and international nuclear workforce priorities.

The findings illustrate how integrating industry-driven educational pathways with performance monitoring and international cooperation can provide a more coordinated approach to talent attraction, competence development and workforce readiness. The proposed framework also highlights opportunities to strengthen cross-institutional collaboration, facilitate knowledge transfer and support longer-term workforce succession planning.

The paper concludes that linking national educational engagement with European and international nuclear skills initiatives offers a potentially transferable model for strengthening workforce development across the nuclear sector. Progressively extending performance monitoring towards competence acquisition, education-to-employment transitions and workforce retention could further enhance the evidence base for strategic skills planning and contribute to a resilient and future-ready European nuclear workforce.

**KEYWORDS:** nuclear workforce development; industry–academia cooperation; vocational education and training (VET); nuclear skills development; international cooperation; academic engagement; education-to-employment pathways; strategic workforce planning.