Skills 4 Nuclear *

Funded by the
European Union

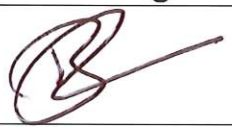
Project Number 101213280

Deliverable D5.1

Peer Learning Activity Report

Lead Beneficiary: UNICAEN

Due date: 15/09/2025 **Released on: 24/11/2025**

Authors:	**Carle BONAFOUS-MURAT, Iskren CVETKOV, Soazig DREVILLON, Agathe KERVELLA, Valentin MIGNON, Andreea RALUCA NEDELCU**		
Version:	**1.1**		
For the Lead Beneficiary		**Reviewed by WP Leader**	**Approved by Coordinator**
Hélène Bouraïma Lelong		**Hélène Bouraïma Lelong**	**Teodora Retegan Vollmer**
			

Dissemination level

PU	Public	**X**

Version control table

Version no.	Date of issue	Author(s)	Brief description of changes made
1.0	11/11/2025	See above	1st draft
1.1	13/11/2025	J. Heller, T. R. Vollmer	Review by the coordinator and MST

Project information

Project number:	101213280
Project full title:	Skills for nuclear
Acronym:	SKILLS4NUCLEAR
Call:	HORIZON-EURATOM-2024-NRT-01
Type of action:	EURATOM Coordination and Support Actions
Project Coordinator Organization:	CHALMERS
Coordinator:	Teodora Retegan Vollmer
EC Project Officer:	Katerina Ptackova
Start date – End date:	15/03/2025 – 14/03/2028
Coordinator contact:	tretegan@chalmers.se
Administrative contact:	jakub.heller@evalion.cz
Website:	www.skills4nuclear.eu

Disclaimer

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Commission. Neither the European Union nor the European Commission can be held responsible for them.

EXECUTIVE SUMMARY

The Skills4Nuclear (S4N) project, funded under the EURATOM programme, addresses one of Europe's most urgent challenges in the nuclear sector: the shortage of qualified professionals across fission and fusion domains. As nuclear energy plays a vital role in achieving the EU's green and digital transitions, the project aims to strengthen Europe's capacity to educate, train, and retain a skilled, diverse, and future-ready workforce.

S4N establishes a long-term collaborative framework connecting industry, research, and training organisations to ensure the safe and efficient use of both existing and emerging nuclear technologies, including Small Modular Reactors (SMRs). Its key outcomes include the creation of the European Forum for Nuclear Workforce and Skills — a permanent platform for monitoring and anticipating skills needs — and the delivery of a comprehensive Nuclear Skills Strategy to attract, upskill, and reskill professionals across Europe. A pilot initiative in Poland will test innovative approaches to workforce development and the transition of workers from fossil-based sectors to nuclear and clean energy roles.

This Peer Learning Activity (PLA) explores how nationally funded skills programmes can leverage additional regional and local investment, fostering engagement across the nuclear value chain. Drawing lessons from past initiatives — such as ARCADIA, 3NC (Normandie Nucléaire Nouvelles Compétences), and Nucléofil — the PLA identifies mechanisms through which national funding can catalyse regional co-investment and strengthen local training ecosystems. Field examples from France, Romania, and Bulgaria demonstrate that aligning national investment frameworks with regional mobilisation delivers tangible benefits in workforce planning, training infrastructure, and industrial innovation.

The PLA's comparative assessment highlights differing governance models: France's multi-level coordination combining national strategy with regional empowerment; Romania's and Bulgaria's more centralised systems showing growing regional engagement potential. Across all three, national public funding has proven essential to initiate and sustain nuclear skills development. However, long-term continuity and co-funding mechanisms remain key challenges.

Survey feedback and field analysis reveal common priorities:

- The need to modernise training to integrate digital and AI-related competencies.
- The urgency of generational renewal amid an ageing workforce.
- Persistent gaps in gender balance and social inclusion.
- The strong territorial impact of nuclear skills investment on local economies and public acceptance.

The PLA concludes that the French model of coordinated national–regional partnership, exemplified by the 3NC project and the Université des Métiers du Nucléaire (UMN), provides a replicable blueprint for other European regions. By linking national strategic objectives with regional implementation, and embedding education, industry, and governance actors in shared frameworks, such models enhance sustainability, innovation capacity, and social cohesion.

Building on these results, S4N partners plan to submit a proposal for a European Campus of Vocational and Scientific Excellence in Nuclear Skills. This initiative will connect regional ecosystems through hybrid training programmes, cross-border mobility schemes, and the recognition of micro-credentials, contributing to Europe's broader Pact for Skills and European Skills Agenda objectives.

In line with the EU's Competitiveness Compass and Union of Skills initiative, the Skills4Nuclear project reinforces the strategic ambition of a Europe of Skills — empowering people and regions to drive a just, inclusive, and sustainable clean energy transition.

CONTENT

ACRONYMS AND ABBREVIATIONS

3NC – *Normandie Nucléaire, Nouvelles Compétences*

ARCADIA – Assessment of Regional Capabilities for New Reactors Deployment in New Member States

BTA – Bulgarian News Agency

BNRA – Bulgarian Nuclear Regulatory Agency

CEINE – *Campus des Énergies et de l'Industrie Nucléaire et Énergétique*

CNCAN – *Comisia Națională pentru Controlul Activităților Nucleare*

CoVE – Centre of Vocational Excellence

EDF – *Électricité de France*

Enedis – *Électricité Réseau Distribution France*

EQF – European Qualifications Framework

ESIX – *École Supérieure d'Ingénieurs de l'Université de Caen Normandie*

EU – European Union

EURATOM – European Atomic Energy Community

IAEA – International Atomic Energy Agency

IUT – *Institut Universitaire de Technologie*

JTF – Just Transition Fund

NECP – National Energy and Climate Plan

NGO – Non-Governmental Organization

NPP – Nuclear Power Plant

OECD – Organisation for Economic Co-operation and Development

PLA – Peer Learning Activity

PPE – *Programmation Pluriannuelle de l'Énergie*

S4N – Skills4Nuclear

SKILLS4NUCLEAR – Skills for Nuclear

SNN – Nuclearelectrica S.A.

SMR – Small Modular Reactor

STEM – Science, Technology, Engineering and Mathematics

UMN – *Université des Métiers du Nucléaire*

VET – Vocational Education and Training

WiN – Women in Nuclear

1 INTRODUCTION AND BACKGROUND

1.1 Skills4Nuclear context

The SKILLS4NUCLEAR project, funded under the EURATOM programme, addresses one of the most pressing challenges faced by Europe's nuclear fission and fusion sectors: the growing shortage of qualified professionals. As nuclear technologies play a critical role in the green transition—delivering clean, reliable, and large-scale energy—there is a strong need to reinforce Europe's capacity to educate, train, and retain a skilled workforce. SKILLS4NUCLEAR responds to this challenge by fostering an integrated approach that connects industry, research organisations, and training institutions to ensure that nuclear competence and expertise are maintained and enhanced across Europe.

1.2 Objectives of the project

The Skills4Nuclear project aims to address workforce and skill shortages in EU nuclear fission and fusion sectors by establishing a long-term collaborative framework that integrates industry, research and training bodies. Its primary goal is to ensure the safe and efficient use of current and future nuclear technologies, including Small Modular Reactors, by fostering industry-driven workforce development and enhancing capacity-building in nuclear safety, waste management, decommissioning, radiation protection and medical applications.

A key outcome of SKILLS4NUCLEAR is the creation of the European Forum for Nuclear Workforce and Skills, a permanent coordination and monitoring platform to identify evolving skill needs, anticipate future workforce demands, and continuously align education and training programmes. Complementing this, the project will deliver a comprehensive Nuclear Skills Strategy to attract, retrain, upskill, and reskill professionals across Europe, with a strong emphasis on inclusiveness, diversity, and gender balance. In Poland, a pilot will test innovative approaches to workforce development, while tailored reskilling initiatives will facilitate the transition of workers from other sectors — including fossil fuels — towards roles not only in emerging nuclear technologies such as SMRs and fusion, but also across the broader nuclear field, including large nuclear power plants and the nuclear fuel cycle. Together with evidence-based recommendations, methodologies, and tested tools, these outcomes will build a resilient, adaptable,

and future-ready European nuclear skills ecosystem, reinforcing the sector's contribution to a safe and sustainable clean energy transition.

1.3 Objectives of the Peer Learning Activity

This Peer Learning Activity aims to explore how nationally funded skills programmes in the nuclear sector can leverage additional regional and local investment, thereby fostering engagement and trust across the nuclear value chain, including SMEs and education and training providers. Building on lessons learned from previous initiatives such as the 3NC and Nucléofil projects in France, as well as the outcomes of Euratom projects like ARCADIA, the PLA focuses on the mechanisms through which national government funding can catalyse local and regional co-investment in nuclear skills development.

1.4 European overview of nuclear skills

Across European countries, nuclear energy plays diverse roles within national energy mixes and transition strategies. While countries such as France and the Czech Republic rely heavily on nuclear power to achieve decarbonization, others like Italy and Poland have either phased out or not yet developed nuclear capacity. The document outlines each country's National Energy and Climate Plan (NECP), revealing a shared commitment to achieving climate neutrality by 2050 through a mix of renewable deployment, energy efficiency, and industrial adaptation. The Just Transition Fund (JTF) emerges as a central instrument to support regions most affected by the energy shift—particularly coal-dependent areas—and to mitigate social and employment impacts.

France, Romania, and Bulgaria show different approaches within the same European framework (see APPENDIX A). France maintains a robust nuclear sector that remains the cornerstone of its low-carbon energy strategy and transition governance. Romania leverages nuclear power to strengthen energy security and ensure a fair transition through dedicated financial programs. Bulgaria, meanwhile, integrates nuclear energy into its long-term decarbonization strategy and collaborates with the European Investment Bank on just transition initiatives. Together, these cases illustrate both the diversity and convergence of European efforts to balance energy security, sustainability, and social equity in the move toward a climate-neutral future.

2 METHODOLOGY

To establish a framework for this PLA, a phase of desk research helped provide a comparative overview of European countries' approaches to nuclear energy and their strategies for achieving a just and sustainable energy transition (see APPENDIX A). It compiles qualitative information for each country partner to the Skills4Nuclear project, across several categories, including the share of nuclear power in the energy mix, key highlights from each country's National Energy and Climate Plan (NECP), the link with the Just Transition Fund (JTF) measures, the country's administrative organization and the different actors in the landscape, as well as additional resources.

2.1 Peer learning selection approach

The PLA was conducted within Romanian, Bulgarian and France nuclear landscape to assess the level of coordination among national stakeholders and in the nuclear industry in relation to workforce planning, the alignment between educational and training program and industry needs, as well as to identify actions to enhance the overall attractiveness of the nuclear sector as a career pathway. It examines how coordination between national and regional authorities can strengthen workforce planning, improve alignment between training and research offers and industrial needs, and enhance the attractiveness of the nuclear sector for local populations—particularly in areas transitioning toward a net-zero carbon economy through nuclear energy. This activity seeks to identify synergies and opportunities for joint investment in skills development.

Expected results include an improved understanding of how national funding schemes can act as leverage for regional mobilisation, an assessment of current nuclear skills ecosystems in the target regions, and the formulation of a model for replication in other European contexts. This report includes recommendations on how to design co-funding mechanisms and collaborative governance structures capable of ensuring long-term sustainability, ensuring that the sector remains a driver of local innovation, economic growth, and social inclusion.

2.2 Gathering information

A questionnaire to share best practices and assess the current nuclear skills environment within Romanian, Bulgarian and France regions was designed and distributed to 30 preselected entities in the regions involved (see APPENDIX B). Its purpose was to examine how national government funding can leverage regional and local investment in the nuclear skills supply chain, and how these developments can benefit local populations.

3 FIELD EXAMPLES

3.1 Other projects fostering nuclear skills development

In preparing this Peer Learning Activity, important lessons were drawn from three prior initiatives that have effectively demonstrated how national-level funding in the nuclear skills domain can leverage additional regional and local investment.

At the European level, the ARCADIA project (2013-2016), funded under the Euratom framework, was designed to map and strengthen regional capabilities for new reactor deployment in new Member States. It systematically assessed national and regional infrastructures, competence-gaps, and governance mechanisms, identifying how national funding could be structured to bolster regional research and training ecosystems. Although primarily framed around research infrastructure rather than pure vocational training, ARCADIA highlighted that bridging national funding with regional competence mapping is essential to unlocking further investment and co-funding at regional level.

In France, the 3NC – "*Normandie Nucléaire, Nouvelles Compétences*" project, designed to support training program— part of the France 2030 programme and supported by €42 million in national state funding (within a total project budget of circa €64 million) — highlights the principle of using national budget lines to mobilise regional and sectoral investment. The Normandy region leads a consortium of 36 + industrial, academic and training partners to scale up the nuclear-training offer (from undergraduate to PhD level) and explicitly aimed to trigger complementary contributions from region, local authorities and industry.

Finally, the regional project Nucléofil in the Hauts-de-France region illustrates how a targeted national funding instrument (via the France Relance plan) enabled a regional consortium to develop nuclear-skills training and attract regional investment. With a total budget of €1.3 million the project engaged major industrial stakeholders (EDF, Framatome) and training providers to deliver new diplomas, serious-games and enhanced educational modules.

Together, these three projects provide a robust empirical basis for this PLA's focus on how national skills programmes serve as anchors for additional regional/local investment in the nuclear sector. By triggering additional regional funding in

response to national funding, and involving a wide range of local stakeholders, these projects demonstrate that national funding not only builds capacity, but when properly designed and coordinated with regional authorities and industry, it unlocks further investment, reinforces regional training ecosystems, fosters stakeholder participation (including SMEs and local E&T providers) and contributes to long-term sustainable workforce development.

3.2 Example of Effective Regional Mobilisation : BTA Conference in Vratsa

The Bulgarian News Agency (BTA) organised a regional conference in Vratsa as part of the project "Europe on the Balkans: Cohesion Skills", implemented with the support of the European Commission. The event took place at the BTA National Press Club in Vratsa and gathered key regional stakeholders to discuss European cohesion and education initiatives.

Participants included representatives from local and regional authorities, education institutions, and information centres. Students from the Professional Natural and Mathematical High School in Vratsa also participated. They were among the 15 finalists selected from 130 participants in the prestigious fourth European Competition on Nuclear Energy for Secondary Schools, organised by the European Network for Nuclear Education.

This initiative represents a strong example of regional mobilisation and engagement, successfully bringing together educational, institutional, and civic actors to promote European values, foster skills development, and raise awareness of nuclear energy and related EU initiatives at the local level.

4 QUESTIONNAIRE RESULTS AND FEEDBACK

This Peer Learning Activity (PLA) builds upon a comparative analysis of responses to a questionnaire distributed among institutional, academic, and industrial entities located in Bulgaria, Romania, and France. It aims to identify best practices, assess the current state of nuclear skills in the targeted regions, analyse the effect of national public funding on regional investment mobilisation, and evaluate the social and economic benefits for territories transitioning towards a zero-carbon economy through nuclear energy.

Governance and Institutional Structuring

The comparative assessment of the three countries highlights a centralised governance of nuclear skills development, with varying degrees of territorial implementation:

- In Bulgaria, the Ministry of Energy and the Bulgarian Nuclear Regulatory Agency (BNRA) provide strategic guidance and regulatory oversight within the framework of the National Strategy for Human Resources Development in the Nuclear Field 2022–2032. This strategy sets out measurable objectives and clearly delineates institutional responsibilities. Its design and development were carried out by an inter-organizational working group, complemented by public consultation phases to ensure transparency and collect stakeholder feedback. The participation of key local employers—Kozloduy Nuclear Power Plant and the State Enterprise for Radioactive Waste—throughout the process ensured that their operational needs and workforce requirements were duly reflected in the final strategy. However, since local authorities are not involved in developing skills for nuclear, it limits the adaptation of national training programmes to local development needs.
- In Romania, nuclear governance also remains highly centralised under the Ministry of Energy, with coordination between CNCAN (*Comisia Națională pentru Controlul Activităților Nucleare,* Romanian nuclear safety authority), Nuclearelectrica (SNN) a state-owned company which is the only producer of nuclear energy in Romania and research centres. The absence of a permanent national–regional coordination platform for skills planning results in a project-by-project approach—effective for major infrastructure

projects (refurbishment, SMR deployment) but lacking long-term continuity.

- France, by contrast, operates through a multi-level, networked governance model combining national leadership with regional empowerment. The State defines strategic priorities through national programmes such as France 2030 — a national investment plan aimed at accelerating innovation and industrial transformation in key strategic sectors, including energy, health, and digital technologies, to strengthen France's long-term competitiveness and sovereignty. In France, the multi-annual energy plan (PPE) defines the strategic trajectory and priorities for energy transition, while the France 2030 investment plan supplies the financial and industrial means to realise many of those priorities — together they form two complementary pillars of the country's decarbonisation and innovation strategy. Within this framework, several calls for projects dedicated to skills development, training, and research are supporting the establishment and growth of collaborative consortia. In parallel, French regions play an operational role in co-funding infrastructure, designing campus initiatives and coordinating regional training ecosystems. Besides, the Université des Métiers du Nucléaire (UMN) brings together key industrial, institutional, and educational stakeholders to address the nuclear sector's skills challenges. It leads the national nuclear skills roadmap in coordination with the French government and supports its regional implementation through qualification campuses and partnerships with regional authorities, companies, and training institutions.

Public Funding and Regional Leverage Effects

Across the three countries, national public funding was deemed crucial to initiate and sustain nuclear skills development.

In France, national programmes such as *France 2030* and *Compétences et Métiers d'Avenir* have served as powerful leverage instruments to support workforce and skills development in strategic sectors. For instance, within the 3NC project in Normandy, initial national allocations — amounting to €42 million — effectively stimulated regional and industrial co-funding. To address the identified needs, the Normandy Region, as project leader, mobilised its partners

and responded to the 2022 call for expressions of interest (*Appel à Manifestation d'Intérêt – Compétences et Métiers d'Avenir*), launched under *France 2030*. Following its selection, the 3NC project was awarded €42 million in national funding, out of a total project budget of €64 million. Complementary contributions include €6.1 million from the Normandy Region and €10 million from industrial partners such as EDF, Eiffage, Orano, and Enedis. The project enables the construction of a nuclear technological hall, allowing the pooling of training resources in nuclear physics, the development of shared practical courses across several institutions (universities, IUTs) and the establishment of sustainable training infrastructures. This project allows a significant scaling-up of the training offer, aligning training programmes with the current and future needs of the nuclear sector and its key industrial **players** (EDF, Orano, Framatome, and SMEs in the supply chain). The University of Caen Normandie awards national degrees based on cutting-edge research. So far, the project has resulted in the creation of a new degree — *Specialisation in Nuclear Engineering (ESIX, University's engineering school)* — and the integration of a stronger nuclear focus within existing academic programmes. It promotes a diversified approach to learning, combining initial training, work-study pathways, and continuing education to foster both upskilling and reskilling.

In Bulgaria, derived from the National Strategy for Human Resources Development in the Nuclear Field 2022–2032, a three-year implementation plan has been established. This plan specifies the funding sources for each individual measure. In addition, national mechanisms such as the National Fund for Scientific Research and the National Programme for Qualification Enhancement in Nuclear Technologies and Engineering 2024–2030 provide dedicated financial support. Further national funding opportunities are also available. External sources are utilised as well, including the European Social Fund under the Operational Programme for Human Resources Development 2021–2027, as well as the IAEA Technical Cooperation Programme, among others.

Romania demonstrates a hybrid dynamic where state investment acts as a trigger for additional funding, playing a catalytic role. National decisions on major infrastructure projects (refurbishment, new reactors, SMRs) attracts additional EU and industrial resources. However, the lack of a multiannual funding mechanism dedicated to nuclear skills was stressed out by several respondents as a major barrier to continuity.

This PLA therefore supports the creation, at EU level, of hybrid financing mechanisms combining public contributions, industrial participation, and regional co-funding to secure the sustainability of nuclear training infrastructures and responsiveness of nuclear skills ecosystems.

Current Status and Dynamics of Regional Nuclear Skills

Another challenge identified by respondents was the generational renewal of the nuclear workforce. Ageing staff and declining attractiveness of STEM disciplines are common to all three countries. In both Bulgaria and Romania, despite a well-structured academic network, the number of graduates entering the nuclear field remains at a low level. This situation is primarily driven by a misalignment between educational pathways and industry needs, limited early exposure of students to nuclear topics, and a lack of coordinated national workforce planning. Public perception and outdated narratives around nuclear energy further reduce sector's attractiveness among young professionals. Additionally, competitive opportunities abroad and limited domestic research funding contribute to talent migration. Respondents highlight regional disparities and difficulties in attracting technical profiles outside major clusters.

France stands out with a comprehensive and vertically integrated training ecosystem, ranging from vocational diplomas to doctoral programmes, and with strong company–education partnerships. Work-based learning, apprenticeships and industrial placements are mainstreamed throughout curricula, ensuring high employability and rapid workforce adaptation to evolving industrial needs, particularly for shortage occupations such as welders, radiation protection technicians and process engineers. The continuum of training and lifelong learning — spanning initial education, professional upskilling and requalification — was highlighted as a highly transferable blueprint for Central and Eastern European partners. Nevertheless, some barriers include lack of attractiveness of the industry sector, (not specific to nuclear field, but impacting it as well), lack of attractiveness of STEM (Science, Technology, Engineering and Maths) studies, and challenges in reaching poorly represented in the nuclear sector, such as women, seniors, people from urban priority neighbourhoods, rural areas and foreign students. The French Nuclear Skills Roadmap, coordinated by UMN (Université des Métiers du Nucléaire) with the support of the French government,

is structured around three strategic pillars (Attract, Train & Recruit) and 30 concrete actions designed to strengthen the national nuclear skills ecosystem.

Innovation, Digitalisation and Modernisation of Skills

Digital and emerging skills were consistently cited as a growing priority. In Romania, the introduction of digital twins and simulation tools in SMR-related projects marks significant progress. Bulgaria shows early-stage initiatives in cybersecurity and data analytics, yet integration across curricula remains partial. France, has already started to develop these competences, embedding modules on artificial intelligence, robotics for decommissioning and virtual reality-based safety training across its national network.

It was widely acknowledged that anticipating the digital and artificial intelligence transition of nuclear professions is essential to maintain competitiveness and safety standards. Respondents stressed out the need for EU-level cooperation to develop harmonised reference frameworks (EQF-aligned) for these new profiles.

Territorial Impacts and Socioeconomic Benefits

The analysis confirms that investment in nuclear skills produces tangible local development impacts when embedded in regional ecosystems.

In Kozloduy (Bulgaria) and Cernavodă (Romania), training centres and industrial activities have created high-quality employment, stabilised local economies and fostered stronger public acceptance of nuclear energy. However, the growing need for trainers and modern equipment slows down the scale-up of vocational training. Respondents also pointed to gaps in the continuum between VET and university education, as well as long lead times to train qualified technicians for operation and maintenance roles. In France, regional campuses (e.g. CEINE in Normandy) produced similar effects, stimulating SME participation in the supply chain, promoting youth employment, and facilitating the requalification of workers from declining sectors.

Nevertheless, respondents underlined the importance of targeted measures such as mobility grants, blended learning options, and local employment partnerships to maximise community benefits and social acceptance.

Inclusion, Diversity and Social Acceptance

Social inclusion and gender balance remain underdeveloped in dimensions of the nuclear skills agenda. Bulgaria and Romania both reported initiatives to increase female participation and attract underrepresented groups, but these remain fragmented. According to available data, women represent approximately 24% of the nuclear workforce in France and around 33% in Bulgaria. In Romania, women are progressively better represented in Romania's nuclear education and research ecosystems (35–45%), and increasingly visible in regulatory and managerial structures. However, technical, operational, and executive positions still show under-representation (25–27%). These figures are broadly consistent with the overall average reported by the report on Gender Balance in the Nuclear Sector of the OECD Nuclear Energy Agency, which estimates that women account for about 25% of the nuclear workforce across member countries. Nonetheless, there are initiatives like Women in Nuclear and Black Sea Women in Nuclear Network which are providing mentorship and are linking woman with various roles in the nuclear industry. France has launched more structured initiatives, such as *Women in Nuclear France*, Fem'energia competition, scholarship programmes through UMN, and targeted communication campaigns to improve the visibility of technical careers.

Regarding public acceptance, respondents from different countries highlighted the importance of information centres and transparent communication initiatives in fostering trust and strengthening local engagement with nuclear projects. Examples include Kozloduy's Information Centre, open-door days at Cernavodă and Kozloduy NPPs, and various outreach activities such as the Children's Drawing Contest "NPP – Energy for Clean Nature", the Emergency Preparedness Competition for high-school students, participation in the "Manager for a Day" programme, and France's "Nuclear Profession Week", co-organised by UMN and France Travail, the French national employment agency. The latter provides opportunities for numerous companies in the nuclear sector to open their doors to the public annually.

Integrating skills development within these outreach and engagement frameworks contributes not only to enhanced employability but also to strengthened social cohesion in transition regions.

The exchanges between partners demonstrated the added value of continuous European cooperation in this domain. The adaptation of the French 3NC model to

Bulgarian and Romanian contexts appears a pragmatic and high-impact pathway to accelerate skills development, foster regional cohesion, and ensure tangible socioeconomic benefits for local populations in their transition towards a zero-carbon future.

5 ASSESSING WHETHER THE PLA CAN BE REPLICATED IN OTHER REGIONS

The Peer Learning Activity (PLA) has shown that the integration of national investment frameworks with regional engagement mechanisms provides a replicable and effective approach to strengthening Europe's nuclear skills ecosystem. Although governance and financing structures vary across Member States, the underlying principle is transferable: national funding serves as a catalyst for regional co-investment, thereby enhancing resilience, inclusiveness, and innovation capacity within the nuclear sector.

The replicability potential largely depends on the capacity to adapt the French model of national–regional partnership to different institutional contexts. Establishing a clear coordination interface—such as a national nuclear skills coordination body—appears critical to ensure alignment between national strategic objectives and regional implementation. Furthermore, linking national skills programmes to Smart Specialisation Strategies and National Energy and Climate Plans ensures policy coherence and long-term mobilisation of local investment.

A replication of the French 3NC (Normandy, Nuclear, New Skills) and UMN (University for Nuclear skills, nuclear skills coordination body in France) model would be a significant and highly beneficial development for nuclear skills, local development, and strategic planning. The model's success in coordinating a public-private consortium to address a regional skills deficit is well-documented and highly relevant to Bulgaria's and Romania's challenges:

- Comprehensive skills ecosystem
- Targeted and diverse training
- Enhanced recruitment and talent attraction
- Increased private sector involvement
- Streamlined career pathways

Extending the analysis to other countries in the consortium

Countries and regions best positioned to replicate the PLA model share three enabling conditions:

- A clear national commitment to nuclear policy and skills investment.
- Operational mechanisms for regional co-investment and stakeholder engagement.
- An existing industrial or institutional base (utilities, research centres, VET/university providers).

In such contexts, national allocations can be effectively leveraged to stimulate sustained local mobilisation. Conversely, where national funding is fragmented, multiannual programmes are lacking, or regional actors have limited formal roles, preparatory actions—such as capacity-building and governance alignment—are required.

Key determinants for replication identified in the deskwork:

• National policy and market context. Where nuclear occupies a significant role in the national energy mix (France, Czechia, Sweden), national programmes already act as anchors that regional stakeholders are prepared to leverage. In countries with active national nuclear programmes or clear plans for new builds (Poland) the potential for national funds to crowd in regional/investor contributions is high. In contrast, countries with limited or paused nuclear programmes (Italy) face structural barriers that reduce immediate leverage effects.

• Governance and coordination capacity. The French multi-level model—national strategic funding combined with empowered regional actors and a coordinating body for curriculum adaptation—illustrates how national funds can be conditional on regional buy-in and thereby attract co-funding. Replicability is therefore strongest where an institutional interface (national–regional coordination platform, cluster organisation or university-industry consortia) either exists or can be rapidly constituted.

• Financial instrument design. The desk file shows that where national allocations are structured to encourage co-financing (matching grants, targeted capital investment for training infrastructure), regions and industry are more likely to

commit funds (France: 3NC example). Multiannual, flexible national lines that explicitly require/encourage regional and private contributions are more effective leverage tools.

• Local ecosystem maturity. Regions already hosting nuclear facilities, research institutes, or training centres (Kozloduy, Cernavodă, French regional campuses) are predisposed to translate national funding into local investment. Regions without these anchors will require staged interventions (seed investments, capacity building for E&T providers, SME engagement) before full replication.

6 SUBMITTING A PROPOSAL FOR A CAMPUS OF VOCATIONAL AND SCIENTIFIC EXCELLENCE IN NUCLEAR SKILLS

The PLA and the desk research on which it is based will feed into a project for a Campus of Vocational and Scientific Excellence in nuclear skills, aiming at establishing a network of regional nuclear skills ecosystems.

However, instead of focusing on the needs of the nuclear sector only, other European CoVEs or Blueprints for sectoral cooperation on skills, ongoing or completed, will be involved through a process of upward convergence. The project proposal will be drafted during the first year of the S4N consortium to be submitted at M14, under the 2026 Erasmus+ work programme. Should the application be successful, the Campus, meant to continue beyond completion of S4N, should raise additional funding of about €4.000.000. Following the model established in the 3NC project, the Campus will aim to identify regional ecosystems where there is the necessary critical mass of expertise, including scientific expertise, to provide development of skills, reskilling and upskilling opportunities, with a view to (though not limited to):

- Setting up hybrid training programmes (involving VET providers and academic institutions) where appropriate,
- Facilitating mobility of learners and workers and the recognition of qualifications, including through micro-credentials and certifications,
- Enhancing the attractiveness of those nuclear education programmes to foreign talent, using for that purpose the new talent partnership instrument announced in the EU Pact on Migration and Asylum.

Each ecosystem will mobilise a broad range of stakeholders encompassing – alongside industry (including SMEs), research-performing organisations (including engineering schools and universities) and education providers (including VET actors) –, inter alia regional competitiveness clusters, regional and local authorities, chambers of commerce and industry, public employment services, trade unions, civil society organisations and NGOs, or innovation and development agencies.

7 LINKS TO OTHER EUROPEAN INSTRUMENTS : PACT FOR SKILLS

The Skills4Nuclear project is part of the European strategy that places particular emphasis on skills. Indeed, the European Commission places strong emphasis on developing skills as a cornerstone of Europe's long-term competitiveness, innovation capacity, and social cohesion. Skills are seen as essential to enable the green and digital transitions, address labour shortages, and ensure that no one is left behind in an evolving labour market.

In this context, the European Skills Agenda and the Pact for Skills serve as key instruments to promote upskilling and reskilling across the Union. The Pact for Skills brings together public authorities, companies, social partners, and training providers in large-scale partnerships within strategic sectors — such as renewable energy, transport, healthcare, and digital industries. Its aim is to mobilise investments and commitments to equip Europe's workforce with the right skills for a competitive, fair, and sustainable economy.

The EU also launched the Union of Skills initiative in 2024 to reinforce lifelong learning, improve recognition and portability of qualifications across Member States, and attract global talent. This initiative highlights the need for strong foundations in basic, digital, and green skills, while ensuring that training systems remain inclusive and adaptable.

In parallel, the EU Competitiveness Compass, introduced in 2025, identifies "promoting skills and quality jobs" as one of the key horizontal enablers of competitiveness. It underlines that Europe's ability to close productivity and innovation gaps depends directly on its capacity to develop a highly skilled and resilient workforce.

Altogether, these initiatives reflect the EU's strategic commitment to a "Europe of skills," ensuring that people and businesses can thrive in a fast-changing world, and the S4N project participates to this effort.

Skills4Nuclear – APPENDIX A

Deskwork

	Peer Learning Activity questionnaire	National energy and climate plans (NECPs)	Just transition (fund)	Administrative organization	Other resources
France	In France, nuclear energy plays a central role in electricity production. In 2023, it accounted for approximately 65% of total electricity production. The French energy mix is characterised by a significant share of renewable energies, reaching 28.2% of total electricity production in 2023. This share mainly comprised hydroelectricity (11.5%), wind power (9.9%) and solar photovoltaic power (4.3%) (https://fr.statista.com/statistiques/472545/proportion-nucleaire-production-d-electricite-france/). In 2024, France connected the Flamanville 3 nuclear reactor to its grid, marking the first addition to its nuclear fleet in 25 years. This 1.6-gigawatt reactor began operations in September 2024 and was connected in December, although the project experienced delays and cost overruns. (https://www.reuters.com/business/energy/france-adds-first-nuclear-reactor-25-years-grid-2024-12-21)	France's **green planning strategy** could impact **8 million jobs** and create a net **150,000 jobs by 2030**. To support this transition, the strategy integrates **industrial and skills development**, identifying key sectors, investment needs, and workforce requirements. **Action plans**, jointly developed by industries and the government, will be implemented across all sectors, following the model of the **nuclear skills promotion plan**. As some industries decline or close, **territorial support measures** will facilitate workforce mobility. **Generational renewal challenges**, particularly in agriculture, highlight the need for **training system reforms**. This includes developing **cross-sector and specialized skills** for the carbon-neutral economy. A **label for 'schools of the energy transition'** under the **France Nation Verte** initiative could enhance training visibility and attractiveness. The strategy aligns with **France 2030**, mobilizing **large companies, SMEs, and reindustrialization efforts** while encouraging investment in the green transition.	The French part of the JTF covers all coal territories, which, however, does not mean that it is limited to them. It consists of two components: the first "economic development" is based on the ERDF and is implemented by the relevant regional councils. The second "social and employment" component is implemented by the State at regional level (DREETS). Measures are currently being taken to mobilise these funds in the four territories still affected by the closure of coal-fired power plants (Bouches du Rhône, Loire Altantique, Moselle) but without final arbitration at that date, be it projects or applications under investigation or for which business decisions are pending. As regards the coal plant already closed in Le Havre (Normandy), no JTF mobilisation is envisaged. The territorial just transition plans are factually in line with the current French situation.	All public engagement initiatives that have been carried out since 2021 have ensured inclusive public participation and broad participation of all relevant authorities, including local authorities, civil society and all stakeholders, including social partners, in the preparation of France's integrated national energy climate planFrance is involved in 3 regional cooperations: **Pentalateral Energy Forum** (Penta) is a voluntary regional cooperation between Belgium, France, Germany, Luxembourg, the Netherlands and since 2011 Austria, **North Sea Energy Cooperation** (Belgium, Denmark, France, Germany, Ireland, Luxembourg, the Netherlands, Norway and Sweden, with the participation of the European Commission), **The High Level Group on Interconnectors in South-West Europe** (Heads of State and Government of Spain, France, Portugal and the President of the European Commission). (NECP page 39).	
Bulgaria	In 2024, nuclear energy accounted for more than 42% of electricity production in Bulgaria, making it the country's main source of low-carbon energy (https://lowcarbonpower.org/fr/region/Bulgarie). The Kozloduy Nuclear Power Plant, the only nuclear facility in operation in Bulgaria, operates two VVER reactors, each with a capacity of 1,000 MW. These reactors were commissioned in 1987 and 1991, and were granted operating licence extensions in 2017 and 2019 respectively. In addition, Bulgaria has initiated projects to diversify and strengthen its energy mix. In 2023, approximately 22.6% of the energy used in the country came from renewable sources, up from 19.04% in 2022. (https://europeannewsroom.com/fr/pres-de-226-de-lenergie-utilisee-en-bulgarie-en-2023-provient-de-sources-renouvelables/) In addition, the Bulgarian government is considering the construction of new nuclear reactors, as well as the integration of small modular reactors (SMRs) to meet future energy needs.	By **2050**, climate change is expected to have a **negative economic impact** in **Bulgaria**, particularly in **agriculture, energy, and transport** sectors. Both **skilled and unskilled labor revenues** are projected to decline, leading to **rising poverty levels**. The **climate adaptation analysis** highlights key takeaways: **Sectoral transformation, mitigation, and adaptation** can generate **positive effects** despite climate challenges. / **External funding**, such as **EU structural funds and climate finance mechanisms**, can support adaptation alongside national resources. / **Broad allocation of adaptation funding**—not just targeting vulnerable sectors—can **boost the economy**, increase capital in **productive industries**, and drive **economic growth**, helping to offset climate-related losses.	The EIB will also cooperate with the EC in developing the Just Transition Fund to support regions experiencing difficulties in transitioning to a carbon-neutral economy. The EIB will finance up to 75 % of the eligible costs. Projects will benefit from EIB (European Investment Bank) financial support and advisory services. The programme also includes the 3 Territorial Just Transition Plans (TJTPs) of the provinces of Pernik, Kyustendil and Stara Zagora, together with 10 adjacent municipalities. In the coming decades, these territories will face a profound economic transformation as a result of the transition to climate neutrality.	**Bulgarian energy governance structure:** National Assembly & Council of Ministers: Define and implement state energy policy, different ministries, Agency for Sustainable Energy Development (SEDA), Energy and Water Regulatory Commission, Nuclear Regulatory Agency. (NECP section 1.2)	**Bulgaria: the 2021-30 strategic framework for VET** : https://www.cedefop.europa.eu/en/news/bulgaria-2021-30-strategic-framework-vet / **OECD Skills Strategy Bulgari**a: https://www.oecd.org/content/dam/oecd/en/publications/reports/2023/06/oecd-skills-strategy-bulgaria_eb96bc20/c2eb2f34-en.pdf
Romania	In 2021, nuclear energy accounted for approximately 19% of electricity production in Romania. The country's energy mix at that time consisted of 36.2% fossil fuels (18.2% coal, 16.7% natural gas, 1.3% oil) and 44.8% renewable energy (29.8% hydroelectricity, 11.1% wind, 2.9% solar, 1.1% biomass). Romania plans to increase the share of nuclear power in its energy mix by building two new reactors at the Cernavodă power plant, with commissioning scheduled for 2030 and 2031. These additions would bring the contribution of nuclear power to around 30% of the country's total electricity production. Source: https://energynews.pro/ro-roumanie-investit-dans-lexpansion-nucleaire-avec-deux-nouveaux-reacteurs-a-cernavoda + videohttps://www.youtube.com/watch?v=B3Twp_w5kL4	One of the social benefits of the decarbonization process of the society is the creation of green jobs. Almost 100,000 new green employment will be created by the year 2050 with the realization just on some of the proposed policy and measure. Most newly generated green jobs will be direct jobs and will be due to the manufacturing, construction, installation, operation and maintenance of the green technologies. The greening of the economy will also be facilitated through indirect jobs that do not require specialized green knowledge or duties. For instance, new jobs will be created when materials employed for green technologies manufacturing are produced, when these products are handled, and when they are sold.	Romania's Just Transition Programme is a financial plan that will help the country to transition to a climate-neutral economy by 2050. The PTJ will focus on six counties that are most affected by the transition. Some of the key areas to be supported based on of Romania's PTJ are: o Development of renewable energy projects, such as solar and wind farms; o Improvement of energy efficiency in buildings, industry, and transport; o Creation of green jobs in the renewable energy sector, energy efficiency sector, and other sectors that are helping to reduce greenhouse gas emissions. o Upskilling and reskilling of workers who are affected by the transition, which will help them to find new jobs in the clean energy sector or other sectors. Through the Territorial Just Transition Plan, which is based on the Just Transition Programme and approved by the European Commission in December 2022, six Romanian counties: Dolj, Galați, Gorj, Hunedoara, Mureș and Prahova will be financially supported, with the objective to phase out coal by 2032.	Ministry of Energy (ME), Ministry of Environment, Waters and Forests (MMAP), Ministry of Economy, Entrepreneurship, and Tourism (MEAT), Ministry of Finance, Ministry of Transport and Infrastructure (MTI), Ministry of Agriculture and Rural Development (MADR), Ministry of Development, Public Works and Administration (MDLPA), Ministry of European Investments and Projects (MIPE), Ministry of Labour and Social Solidarity (MMSS), Ministry of Education, Ministry of Research, Innovation and Digitalization (MCID), National Institute of Statistics (INS), National Commission for Strategy and Prognosis (CNSP), The National Regulatory Authority in the field of Energy (ANRE), National Agency for Mineral Resources (ANRMPSG), Key energy companies such as Transelectrica, Transgaz, OPCOM and Conpet, Professional business associations and economic operators (NECP page 51).	
Spain	In 2023, nuclear energy accounted for approximately 19.9% of electricity production in Spain. The Spanish energy mix was characterised by a significant share of renewable energies, reaching 52.3% of total electricity production in 2023. This share mainly comprised wind power (22.5%), solar photovoltaic power (15.1%) and hydroelectric power (10.9%). Spain plans to gradually close its nuclear power plants by 2035, focusing on the development of renewable energies to compensate for this reduction. This energy transition aims to reduce dependence on fossil fuels and promote more sustainable and environmentally friendly electricity generation. Source: https://www.revolution-energetique.com/la-sortie-du-nucleaire-suscite-des-inquietudes-en-espagne/	In order to identify new fields of employment and occupations, new skills and competences required for professional practice and to develop a proposal for the creation of skills in line with the needs of the green transition, the Biodiversity Foundation, together with the Spanish Climate Change Office, has drawn upthe study 'Employment and green transition. Employment sites, job transformation and training challenges in sectors related to climate change and biodiversity in Spain". This study identifies 40 strategic occupations, which will need to be created or reoriented in order to move, in the next decade, towards the green transition. Objectives: improve training, increase the supply of scientific and technological training, together with the development of skills and skills related to the green and environmental transition among professionals in the renewable energy sector, attract new talent, adapt professional profile, etc.	Completing the Strategic Energy and Climate Framework, the Just Transition Strategy, adopted in 2019, has as its main objective to maximise employment opportunities and minimise the impacts of the energy transition. Just Transition Conventions have been developed in the affected areas to support new business and industrial initiatives, local social and environmental infrastructure, support to workers and environmental mine restoration works. In this way, projects driven by aid granted or agreements reached in May 2023 will create a similar volume of employment as in the installations under closure, as implemented, although this distribution is not the same among all the areas concerned. Support programmed under the Just Transition Fund will mostly be channelled through grants to private entities or transfers to public entities, where these have the role of beneficiaries, although financial instruments are also envisaged.	MICIU (Ministry of Science, Innovation and Universities) is the department of the General State Administration responsible for proposing and implementing policy on scientific research, technological development andinnovation in all sectors. It is therefore responsible for developing R & I & c policy in the energy and climate sector, in coordination with the other ministerial departments with RDI actions in these areas and other actors involved. With regard to cooperation at national level, highlights the role of the Spanish Technology Platforms, which are team-working forums, led by industry, which include all SECTI actors (companies, technical centres, public research bodies, universities, R & D & I centres, associations, foundations, etc.), with the central objective of defining the short-, medium- and long-term vision of the sector and establishing a strategic R & I route. (NECP page 59).	Tecnatom, training for professionals in the nuclear sector : https://www.tecnatom.es/en/nuclear-sector/nuclear-training/#

Italia	Italy has not produced nuclear power since 1990, following the closure of its four reactors after the 1987 referendum. (https://www.sfen.org/rgn/le-regard-neuf-de-litalie-sur-le-nucleaire). In 2024, Italy's energy mix consisted mainly of fossil fuels and renewable sources. Renewable energies, particularly hydroelectricity, wind and solar power, contributed to nearly 50% of total electricity production. (https://lowcarbonpower.org/fr/region/Italie) Recently, Italy has been considering reintroducing nuclear energy into its energy mix. In February 2025, the government passed a law to lift the ban on nuclear energy, which had been in place since the 1987 referendum. This initiative aims to strengthen energy security and achieve decarbonisation targets. The plan calls for the use of advanced modular reactors, with the goal of nuclear energy accounting for between 11% and 22% of the energy mix by 2050. Discussions are underway with international companies, such as Westinghouse and EDF, to develop these new nuclear infrastructures in Italy. Source: https://www.reuters.com/world/europe/italys-government-adopts-plan-return-nuclear-	The current VET offer does not yet seem to adequately include these new skills sets in education and training programmes. Indeed, the survey for VET providers highlighted the weakness of supply in relation to the professionals most relevant for the future by drawing the distance between the supply already available and the one needed for a balanced development of the sector.	For Italy, the areas of the Province of Taranto and Sulcis Iglesiente have been indicated. The JTF investments for Italy are therefore concentrated in these two areas of the country through the implementation of a national JTF programme, the managing authority of which is the Agency for Territorial Cohesion. Currently, there are six coal-fired thermal power plants operating in Italy, which are generally located in a prominent industrial area. The phase out of coal will be accompanied, with a view to ensuring a transitionfair energy, measures to protect workers for job development and retraining, the fight against poverty and inequality, and the safeguarding of their territories.	Exclusive power of the State in matters relating to the energy sector, including: relations with the European Union; protection of competition; protection of the essential levels of benefits relating to civil and social rights; protection of safety and public security; environmental and ecosystem protection. Within the principles laid down by national law, the functions entrusted to the Regions include: formulation of regional energy policy objectives; location and construction of district heating installations; development and exploitation of indigenous resources and renewable sources; granting of hydroelectric concessions; energy certification of buildings; ensuring environmental and territorial safety and compatibility conditions; security, reliability and continuity of regional supplies. (NECP page 50).	
Netherlands	In the Netherlands, nuclear energy accounts for a modest share of the energy mix. In 2023, nuclear power contributed approximately 3.3% of the country's total electricity production. The country has only one operational nuclear power plant, located in Borssele. This pressurised water reactor, commissioned in 1973, has a capacity of around 485 MW and produces enough electricity to power around one million homes. (https://efectis.com/fr/lenergie-nucleaire-aux-pays-bas). The Dutch energy mix is dominated by fossil fuels, which accounted for 47.6% of electricity production in 2023, with natural gas at 37.5% and coal at 8.7%. Renewable energies also account for a significant share, totalling 47.6% of production, divided between wind (23.6%), solar (17.3%) and biomass-waste (6.5%). Looking ahead, the Dutch government plans to increase the share of nuclear power in its energy mix. Discussions are underway with potential suppliers, such as EDF, KHNP and Rosatom, for the construction of new nuclear power plants. In addition, a budget of more than €300 million has been allocated to extend the existing reactor and study the construction of two high-power reactors, as well as the deployment of small	The **Netherlands' transition to a climate-neutral economy** is reshaping the **labor market**, with **green jobs growing** while **coal and oil jobs decline**. By **2030**, climate action is expected to **create up to 72,000 jobs**, while **11,000 may be lost**. To address **labor shortages**, the **Green and Digital Jobs Action Plan (2023)** focuses on: **Expanding technical education** to attract talent. / **Improving job retention** and career transitions. / **Boosting productivity** through innovation. / **Aligning education, industry, and authorities**. In **2024**, a **new governance structure** will oversee progress. Key initiatives include: **Techniek Valley Plan** (ICT workforce expansion). / **Techniek Inclusive Pilot** (diversity in tech). / **€123M for vocational retraining programs**. These measures ensure a **skilled workforce** for the **green transition**.	The main objective of the JTF is to enable regions that rely heavily on fossil fuel revenues and employment in a just equivalent way to engage in an energy transition. The total JTF budget for the Netherlands is aroung EUR 630 million, running from 2021 to 2027. The JTF financial envelope dedicated to the Netherlands goes to six regional territories most negatively affected by the impact of the climate transition and thus facing major transition challenges. These include regions with large emission-intensive industries. The projects focus on three tracks: innovation, investments in technology, systems and infrastructures, and labour market.	In accordance with the Climate Law, the Coordinating Minister for Climate and Energy, hosted by the Ministry of Economic Affairs and Climate Policy, bears the (end) responsibility for the target scope of the targets in the Climate Law and the Planning and Accountability Cycle. The specialist ministers are responsible for achieving the sectoral share of climate policy. The Planbureau voor de Leefomgeving (PBL) is an independent accounting officer in terms of living, environmental, climate and energy. Each year, the PBL publishes the Climate and Energy Outlook (KEV). An independent Scientific Advisory Board (WKR) has been established to advise the government on climate policy. It has been operational since April 2023. (NECP page 14).	
Poland	No nuclear power currently: Poland has no nuclear power plants in operation. Its electricity supply is heavily dependent on coal (80% in 2021). Ambitious nuclear plan: The country plans to build six reactors (6 to 9 GW), with the first reactor operational in 2033 and the programme completed by 2043. Technological choices: In 2022, Poland selected Westinghouse (USA) for its first power plant in Lubiatowo-Kopalino and is in discussions with KHNP (Korea) for another project in Pątnów. Objective: To reduce dependence on coal and achieve 16% nuclear power in the energy mix by 2040.	Achieving a responsible climate and energy transition is a multi-annual process that also requires adaptation and staffing and skills development, consistent with priority development directions, sectoral challenges and needs and the evolving technological developments. Skills are essential for social, industrial and economic development, as well as for gaining greater public acceptance for change, especially in communities and regions exposed to the negative impacts of the energy transition. The creation of a pool of specialists in different fields will be able to respond to the challenges faced by Poland's energy in the coming decades.	The transition to a low-carbon economy will bring many benefits, but, like any change, requires careful action to address the potential negative impacts of change. For this reason, there is a strong emphasis on the need to ensure a just dimension of the transition, which should take into account two aspects, both of which are addressed in this area. As a first step, it is worth noting that the transition, especially during the transition period, may result in higher energy prices. On the one hand, the use of fossil fuels is charged with additional charges, on the other hand new technologies requiring support, and the operation of renewables, backup and balancing sources also increases the costs of energy supply. For this reason, it is necessary to protect the social groups most at risk of energy poverty. The second aspect in the context of a just transition is to provide support to coal-based coal regions in previous decades, so that the socio-economic problems of these regions are not adversely affected.	Strengthening the role of energy clusters and energy cooperatives in the national energy system will be ensured by setting transparent rules for cooperation within energy clusters, including administrative and legal improvements and a special support scheme, as well as by stimulating the development of energy cooperatives supporting the development of distributed energy in rural areas. Efforts will be made for energy communities to develop towards self-sufficiency (NECP page 87).	Polish Nuclear Power Program : https://www.gov.pl/web/paa-en/Polish-Nuclear-Power-Program
Czech Republic	In the Czech Republic, nuclear energy plays a major role in electricity generation. In 2024, it accounted for approximately 40% of total generation, with power stations such as Dukovany and Temelín producing 14.7 and 15 terawatt hours respectively. (https://francais.radio.cz/en-legere-baisse-en-2024-la-production-denergie-nucleaire-en-tchequie-repartira-8838835) The government plans to increase this share to 68% by 2040, thanks to the addition of new reactors. (https://www.nuklearforum.ch/fr/nouvelles/republique-tcheque-la-part-du-nucleaire-setablira-68-lhorizon-2040). In July 2024, South Korea's KHNP was selected to supply the reactor technology for these new units. The Czech public is largely in favour of nuclear power, with 77% expressing positive opinions about its future in the energy mix. (https://www.euractiv.fr/section/energie-climat/news/les-tcheques-sont-les-europeens-les-plus-favorables-au-nucleaire)	The allocation of revenues from the sale of emission allowances to investment aid incentivises significant investments in the economy that have a positive multiplier effect on economic activity. In absolute terms, employment, measured by thousands of people, is increasing slightly year-on-year until 2026, peaking at 5.48 million people, before gradually declining to 4.71 million in 2050. The most significant increase in employment is in the construction and construction sectors, which is linked to the investment activity of building new energy sources and saving energy.	Objective: reduce the use of coal for the production of electricity and heat by 2033. In addition to the need for significant investments in the modernisation of energy and heating, it is necessary to address the social and economic effects of this downturn, of course primarily in the coal regions. The themes supported include retraining of staff. In 2023, 'Education in firms' calls were launched to upskill and upskill workers for new sectors, such as technical and continuing vocational training. The aid is conditional on the establishment of transformation plan for the undertaking. In 2024, a call for employment support in the Ústí Region was launched to support active employment policy tools in the region. Calls will be launched in 2024 to strengthen social stability and support primary and secondary schools with a combination of social problems. Strengthening social stability will be implemented, for example, through specialised training of staff on social and preventive services, ensuring staffing capacity for long-term work with children and youth, and strengthening children's and youth's collectives by supporting preventive stays	As regards the administrative structure of the implementation of national energy and climate policies, the Ministry of Industry and Trade, which is the central government authority in the field of energy, and the Ministry of the Environment, which is the central government authority in the field of climate policy, play an important role. On 12 April 2023, the Czech Government approved an update of the Czech State Energy Policy and related strategic documents. This document inspired the creation of the Commission and the Energy and Climate Strategy Platform, where relevant departments and other relevant actors are represented, namely the Chamber of Commerce, the Confederation of Industry and Transport, the Green Circle, the Union of Cities and Municipalities or the Association of Regions. (NECP page 33). The draft update of the Czech Republic's National Plan was consulted regionally at the level of the Visegrad Four (V4), representing the Czech Republic, Slovakia, Poland and Hungary.	
Suède	In Sweden, nuclear energy accounts for approximately 29% of total electricity production in 2023. The country's energy mix is dominated by renewable energies, which account for 68.9% of production, divided between hydroelectricity (39.6%), wind power (20.6%), biomass and waste (6.8%) and solar power (1.9%). Historically, Sweden operated six nuclear reactors spread across two power plants. However, since 2015, four reactors have been shut down due to various factors, including an increase in the tax on installed thermal capacity and unprofitable electricity prices. (https://www.voicesofnuclear.org/newsletter-des-voix/leurope-et-le-nucleaire-episode-5-la-suede/). Recently, wind power has surpassed nuclear power as a source of electricity (35%). However, in November 2024, the government cancelled 13 of the 14 offshore wind farm projects in the Baltic Sea, citing national security concerns related to tensions with Russia. (https://www.reuters.com/business/energy/wind-power-tops-nuclear-sweden-first-time-trade-group-says-2025-01-09 and https://www.lemonde.fr/economie/article/2024/11/19/ la-suede-reduit-ses-ambitions-en-matiere-d-eolien-en-mer_6402651_3234.html). To meet growing electricity demand and	The transformation of the energy system requires new sustainable energy production, policy and regulatory development and infrastructure investments. A key element of this challenge is to address the issue of skills supply so that skills shortages do not become an obstacle to electrification. The Government has tasked the Swedish Energy Agency with coordinating a national pool of power on skills supply for electrification. In 2023, the Energy Agency presented an interim report focusing on short-term skills needs in electrification. The report further shows that electrification in a range of major industrial efforts, electricity generation, infrastructure and support services generates different skills needs and employment effects. The effects on employment in nuclear and hydropower are considered to be less significant in the short term but need to be addressed from a longer term perspective in further investigation work. The availability of a workforce with the right skills is an important prerequisite for the implementation of climate policy. The green transition is a structural	The Government further considers that measures should be taken to promote a just climate transition and intends to analyse how the Social Climate Fund can best be used in Sweden to enable ambitious climate policies and create acceptance of climate policy instruments. The Government intends to further flesh out this work in the Social Climate Plan to be submitted to the European Commission by 30 June 2025. In addition to its general welfare policy, Sweden benefits from the EU Just Transition Fund. Under the Fund, Sweden has identified industries and regions with very high carbon emissions where efforts are necessary to reduce emissions and tackle the social, employment, economic and environmental impacts of the transition. The industries identified are the steel industry in Norrbotten, the mineral industry in Gotland and the metallurgical industry in Västerbotten.	Since 2022, under the Regional Development Responsibility Act (2010: 630), it has been the task of the municipalities of Gotland and the municipalities of Gotland to set targets and priorities for the provision of regional skills. Regions play a key role in strategically supporting skills development in both the private and public sectors at regional level. This includes assessing current and future skills needs in the regions through active dialogue with employers and industry representatives from both the private and public sectors. Regions also organise employer dialogues and create forums to discuss current and future skills needs. NECP section 1.2.4 : other actors include Ministry of Climate and Enterprise, Swedish Energy Agency (Energimyndigheten), Environmental Protection Agency, Geological Survey of Sweden, Energy Market Inspectorate, Swedish National Grid, Swedish Meteorological and Hydrological Institute, Transport Administration & Transport Agency, County Administrative Boards, Municipalities & Regions.	Regional Development Responsibility Act: https://www.fao.org/faolex/results/details/en/c/LEX-FAOC187837/
UE					National Recovery and Resilience Plans / **ERRIN** : European Regions Research

Skills4Nuclear – APPENDIX B
Peer Learning Activity questionnaire

Context

As evidenced by the 3NC project in Normandy, government funding in nuclear skills development is necessary to leverage additional regional investment. This funding scheme has also been successfully implemented in other French regions with a focus on nuclear skills (e.g. the Nucléofil project launched in 2022 in Hauts-de-France region). Similarly, past Euratom projects such as Arcadia (Assessment of Regional Capabilities for new reactors Development through an Integrated Approach), have shown that ***co-design and co-construction between national and regional authorities is not only a way of maximising public acceptance of nuclear projects, but also a necessary step in order to develop an efficient skills strategy****, including identifying skills gaps around a local area selected for a new build. Building on these two examples UNICAEN will initiate a Peer Learning Activity (PLA), further substantiated with desk research into the final drafts of the National Energy and Climate Plans (to be returned by the end of 2024) and Smart Specialisation Strategies.*

The aim of this PLA to be carried out in the selected regions of ***Bulgaria and Romania****, will be to share best practices from France and to assess* ***current nuclear skills environments*** *in the regions involved as well as the* ***impact of national government funding in leveraging regional and local investment in the nuclear skills supply chain****,* ***and how this may benefit the local population****, especially in regions transitioning towards a net-zero carbon economy through nuclear energy. The final report of PLA will model the results of the PLA so as to assess whether it can be replicated in other regions.*

I. Context

In order to contextualise your responses to the questionnaire, please answer these few questions about the nuclear ecosystem in your region.

1. In your region, nuclear skills (training, employment, research) are mainly the responsibility of:

- ☐Central government/national government
- ☐Regions/local authorities
- ☐The private sector
- ☐Public-private partnerships
- ☐Other (please specify): .....

2. What types of institutions offer training in the nuclear field in your region?

(Tick all that apply)

- ☐Universities / higher education institutions
- ☐Engineering Schools
- ☐Technical centres/specialised institutes
- ☐In-company training programmes
- ☐Other: .....

3. What are the main training and research institutions active in the nuclear field in your region?

4. In your region, in which fields are there nuclear-related training courses available?

- ☐ Nuclear power generation
- ☐ Medical/radiopharmaceuticals
- ☐ Energy security and safety
- ☐ Decommissioning
- ☐ Waste management
- ☐ Other: .....

5. What emerging skills (digital, AI, cybersecurity, etc.) are included in these nuclear training programmes?

6. Are there any ongoing research programmes that may have an impact on nuclear-related research activities?

7. Are there any partnerships between higher education institutions and companies in the nuclear sector?

II. Questionnaire

1. National and regional strategies

- How are nuclear skills development strategies currently articulated between the national and regional levels in your country?
- To what extent are regional authorities involved in the design or implementation of national nuclear skills strategies?
- Are there mechanisms for dialogue and coordination between national and regional stakeholders?

2. Funding and investment

- What role does national government funding currently play in supporting nuclear skills development in your region?
- Have you observed cases where national funding has leveraged additional regional or local investment? If yes, could you provide examples?
- What types of funding schemes (public or private) have been most effective in your context?

3. Skills needs and gaps

- Based on the taxonomy of the Nuclear Energy Agency of the OECD, distinguishing between three levels of specialization (nuclear, nuclearized, and nuclear aware), which of the three categories should recruitment focus on in your region?
- What are the main nuclear skills needs in your region (e.g. electricians, technicians, mechanics, engineering, safety, maintenance, digital, project management)?
- How are skills gaps identified, monitored, and addressed at the regional level?
- Do you collaborate with universities, vocational training centers, or industry to bridge these gaps?

4. Good practices and continual improvement

- Are there existing good practices in your region for co-designing skills strategies between national and regional stakeholders?

- Have you identified any successful initiatives that could be transferred or adapted to other regions?
- What barriers have you encountered in implementing nuclear skills strategies?
- What measures have you set up to ensure the continual improvement of your processes?

5. Impact on local communities

- How does investment in nuclear skills development contribute to local employment and economic development in your region?
- How do you ensure that the benefits reach local populations, especially in areas transitioning towards a net-zero carbon economy?
- Is there evidence that nuclear skills projects improve public acceptance of nuclear energy locally?
- Have any specific measures been taken to integrate vulnerable populations or those who are distant from the labour market into nuclear training programmes?
- Are women well represented in nuclear training programmes and professions?

6. Outlook

- What are your expectations for the role of nuclear energy and nuclear skills in your region's long-term strategy (2030–2050)?
- How could European-level cooperation (e.g. through EU-funded projects) better support your national or regional skills strategies?
- What would you expect from a replication of the French model (e.g. 3NC) in your regional context?
- In the context of replicating the French model, what support would you expect from French partners?