FISA-EURADWASTE 2025 & SNETP Forum

Key messages and outcomes

SNETP Association

c/o EDF

Avenue des Arts 53B, 1000 Brussels, Belgium

Email: secretariat@snetp.eu

Website: www.snetp.eu

This FISA-EURADAWSTE 2025 & SNETP FORUM – Key messages and outcomes report was prepared by the SNETP Association.

9 782919 313433

Table of contents

Introduction

The joint Conference **FISA-EURADWASTE-SNETP FORUM 2025** organised together with SNETP, the European Commission DG-RTD-EURATOM, NCBJ and other partners under the auspice of the Polish presidency of the European council from **May 12 to 16 in Warsaw**, highlighted the essential role of research and innovation in the nuclear field in supporting the strategic objectives of the European Union in terms of competitivity, availability, sovereignty and decarbonisation.

Since last couple of years, Nuclear energy has been experiencing renewed attention within the EU, thanks to its ability to address several major challenges, such as:

- **Acceleration of decarbonisation:** The EU has committed to achieving climate neutrality by 2050, with an intermediate target, expected in 2025, of a 90% reduction in greenhouse gas emissions by 2040. In this context, nuclear energy remains the primary source of low-carbon electricity in Europe and complement the deployment of renewable energy sources.
- **Security of supply**: Nuclear can make a significant contribution by providing stable, dispatchable electricity, backed by a solid EU value chain.
- **Competitiveness:** This issue was central to the Draghi report and is at the core of recent European Commission initiatives such as the *Clean Industrial Deal* and the *Affordable Energy Action Plan*. The EU must develop the necessary tools to ensure its energy remains competitive compared to other regions of the world, to support and strengthen its industrial base.
- **Technological leadership**: The EU has long-standing expertise across the entire spectrum of nuclear technologies and has historically held a leadership position in this field. However, growing investments in other regions of the world, particularly in small modular reactors (SMRs) and fusion, underscore the urgent need for Europe to step up its efforts in research, innovation, and international cooperation. This calls for renewed, ambitious, and sustained support at the European level, starting with the Euratom research and training programme.

The FISA-EURADWASTE 2025 and SNETP Forum 2025, held in Poland, an active member of the **European Nuclear Alliance**, offered a unique platform to explore how nuclear energy contributes to addressing Europe's major challenges.

The discussions took place in a particularly favourable context:

- The extension of the Euratom Research and Training Programme and initial talks on its future within the next EU multiannual financial framework;
- The growing support of the European Investment Bank (EIB), following the World Bank's commitment to invest in nuclear technologies, reflects alignment with the COP28 objectives – where 30 developed countries pledged to triple their installed nuclear power capacity by 2050.
- The continued extensive work of the European Industrial Alliance on SMRs, that was launched in May 2024, to streamline the development, demonstration and deployment of SMR technologies early next decade;
- The endorsement by the European Commission in April 2025 of a candidate Important Project of Common European Interest (IPCEI) on innovative nuclear technologies marks a significant step toward supporting strategic cross-border investments in next-generation nuclear innovation.
- The release of a new roadmap to reduce EU dependency on Russian energy imports;
- And quite recently, the publication by the European Commission of the new *Programme on the Indicative Nuclear Civil (PINC)*, which outlines the deployment trajectory for nuclear energy by 2050.

Together, these developments reflect an unprecedented political and industrial momentum for nuclear energy in Europe. The forum underscored the importance of a coherent and research-based vision to support the EU's climate, industrial, and strategic ambitions.

This 4-day conference offered a comprehensive overview of the research and innovation topics that will shape the future of nuclear fission energy in Europe. Through thematic sessions covering a broad range of topics, the event highlighted the many levers available to the European Union to build a safe, sustainable, and competitive nuclear trajectory.

Safety remains at the core of Euratom's commitment, with particular attention given to preserving existing nuclear assets and exploring technological advances to ensure safe and sustainable long-term horizons.

Nuclear innovation was a central theme, with discussions on small modular reactors (SMRs), targeted for deployment by the early 2030s, new nuclear builds in Europe, and advancements in nuclear fuel cycles and material strategies. Several sessions also emphasized the role of innovation as a driver of strategic competitiveness and autonomy for the EU, whether through enabling technologies, digital and artificial intelligence solutions to enhance nuclear safety and sustainability, or innovative investment and financing models to support demonstration. Beyond electricity generation, nuclear energy was explored in the broader context of meeting non-electric energy needs, including hybrid energy systems.

Human, social, and cultural dimensions were also at the forefront, with sessions dedicated to empowering future generations and engaging civil society, integrating ethical and cultural factors in delivering on the Sustainable Development Goals, and fostering cooperation to attract, retain, and value expertise in the sector. Concrete feedback was shared through emblematic success stories of Euratom collaborative research projects across Europe, showcasing EU' capacity to deliver tangible results while reinforcing nuclear safety, security, and safeguards.

Finally, the conference highlighted the importance of a **cross-cutting approach to innovation** including high-tech applications across sectors, as well as the crucial role played by research infrastructures, open access to data, and international cooperation in sustaining scientific leadership.

As a co-organiser of the conference, SNETP was heavily involved in shaping the programme and ensuring its successful delivery. Many of its members were engaged to take part as speakers, moderators, or session rapporteurs, with strong involvement from both the Governing Board and the Secretariat of the association. In addition, all 38 ongoing projects under the SNETP Open Innovation Platform (SOIP) received significant visibility through the Euratom4U application and the dedicated exhibition area within the conference venue, where posters showcased the main objectives and key results of each project.

The event gathered a total of **663 participants**, reflecting strong interest and engagement across sectors and countries.

- **Top represented countries**

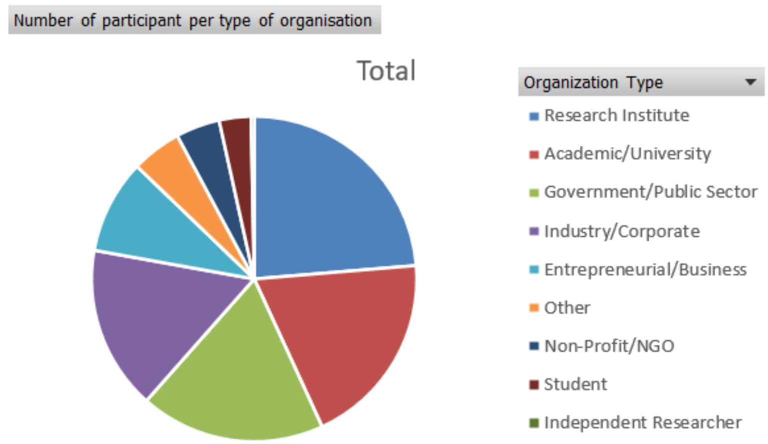
The most represented country was **Poland** with **192 participants**, followed by **France** (102), **Italy** (54), **Spain** (46), **Belgium** (45), **Germany** (29), **Finland** (20), **The Netherlands** (19), and **the United Kingdom** (18).

- **SNETP affiliation**

310 participants were affiliated to member organisations of the association, demonstrating strong involvement of the SNETP community, representing **nearly half of the total attendance**.

- **Representation per type of organisation**

Participants came from a wide variety of organisations, highlighting the event's diversity and cross-sector relevance:



- **Young generation engagement**

Notably, **18%** of participants were young generation members, underlining a growing interest and active involvement from early-career professionals.

In addition to participation metrics, **communication efforts played a key role in the event's visibility and outreach**. The following KPIs illustrate the impact and reach of our communication strategy.

- A total of **14 posts** were published on each of SNETP's platforms: **LinkedIn**, **X**, and **Bluesky**, ensuring consistent and cross-platform visibility.
- A gain of **150+ new followers in one week**, representing a **~5% growth** in our audience. This is a strong signal of growing interest, particularly notable in a specialised field like nuclear.
- With **45,000+ impressions,** more than **15 times our follower count**. The event content reached far beyond our immediate audience, demonstrating high organic amplification and effective messaging.
- The **average engagement rate** reached **22.5%**, which is exceptionally high compared to typical social media averages that are usually between 1-5%. This indicates that the content strongly resonated with our audience.
- A total of **863 reactions** (likes, shares, reposts) were recorded, reflecting positive sentiment and strong sharing behaviour. While comments were limited, this still contributed to boosting organic reach significantly.

This report focuses on the key takeaways from the parallel sessions that followed the plenary discussions. While the plenary sessions will be officially summarised by the main rapporteurs in the Conference proceedings, this document aims to highlight the main technical and scientific discussions that took place during the parallel sessions. It is intended as a resource for all SNETP members and the 600+ participants to reflect on the outcomes, engage further with the panellists, and continue strengthening their interaction with SNETP and its members.

1. Plenary session I "Achieving Net Zero by 2050 in Europe"

Following Plenary Session I on "**Achieving Net Zero by 2050 in Europe**", the three parallel technical sessions explored in greater detail the main topics discussed in the panel, highlighting ongoing European projects and practical experiences and new ideas contributing to Europe's climate goals and discussed future R&D priorities to support the nuclear sector's role in delivering net-zero targets.

1.1. Parallel session – Preserving safely the European assets, pioneering advances for safe horizons

This parallel session was moderated by **Luis E. Herranz** (CIEMAT, ES) & **Miriam Diaz Hernandez** (Spanish YGN, Jovenes Nucleares).

The panellists were:

- **Jean-Christophe Huchard**, Directeur Production Amont, EDF, FR
- **Bram-Paul Jobse**, CFO, EPZ, NL
- **Markéta Dohnálková**, SÚRAO, Chair of IGD-TP, CZ
- **Soufiane Mekki**, RWMC/CDLM, NEA/OECD
- **Tomasz Bury**, Silesian University of Technology, Faculty of Energy and Environmental Engineering, PL
- **Christophe Bruggeman**, Deputy Director-General, SCK-CEN, EURADSCIENCE, BE

1.1.1. Scope

Long-term operations and life-time extensions of nuclear power installations, high level waste management.

1.1.2. Summary of technical session

In this session, the main topic was around how the R&D could help preserving safely the European assets, pioneering advances for safe horizons.

1.1.2.1. Jean-Christophe Huchard, EDF, FR

EDF has extensive experience in managing a large and relatively aged fleet, with significant expertise in long-term operations (LTO). The average reactor age in the fleet is 38 years, providing plenty of opportunities for lifetime monitoring and management activities.

A well-implemented LTO requires strategic condition assessments and planning reviews every 10 years. During these reviews, LTO management aims to set updated safety standards, improve data management practices, and refine analysis methods to align with globally recognized best practices.

LTO stands on two key principles: A systemic and consistent review process and a continuously updated LTO roadmap based on the latest available information.

Based on these experiences, special monitoring and quality management should focus on hard-to-replace components, such as reactor pressure vessel (RPV) internal components, biological shields, cables, and elbows near the RPV.

1.1.2.2. Bram-Paul Jobse, EPZ, NL

Previously, the nuclear industry had to communicate to the public, why nuclear energy is necessary. Now, public discourse has shifted to discussing how and when we can expand the use of nuclear energy.

In Europe, a practical efficiency challenge arises from the fact that, while many people work in the nuclear industry, very few have experience in constructing or operating nuclear power plants. The consensus in Europe is that each generation is responsible for managing the waste it produces. If LTO projects are undertaken, more waste will be generated over a longer time span, meaning that multiple generations may share the same waste management infrastructure.

Small Modular Reactors (SMRs), which are planned to be located at industrial sites, may require increased waste transportation while maintaining the possibility of fuel recycling in shared facilities. Ideally, waste management plans and facilities should be designed to accommodate both LTO projects and fleet expansion strategies.

1.1.2.3. Markéta Dohnálková, SÚRAO, Chair of IGD-TP, CZ

The Czech Republic currently operates two nuclear power plants and aims to construct 2–4 large reactors and up to six Small Modular Reactors (SMRs). Planning the final disposal of existing waste must also account for this future expansion.

The current plan is to have a Deep Geological Repository (DGR) operational by 2050. This domestic development is being validated at the Bukov underground research laboratory, located 500 meters below ground, supporting long-term technical and scientific studies on DGR in authentic conditions. The site selection process is ongoing, with a final decision expected by 2030.

The country has extensive experience in the safe operation of various radioactive waste management facilities, with a track record spanning over six decades. A key forum for information sharing has been the Implementing Geological Disposal Technology Platform (IGD-TP), Europe's Geological Disposal Community. This platform brings together 140 organizations from over 26 countries, with 11 EU nations serving as the executive group.

1.1.2.4. Soufiane Mekki, RWMC/CDLM, NEA/OECD

The OECD Nuclear Energy Agency (OECD-NEA) represents 34 countries, accounting for 84% of global nuclear capacity. International collaboration is essential to prevent overlapping efforts in identifying and achieving the highest global safety standards.

The Waste Management and Decommissioning & Legacy Management Operational Safety Committees are two of the eight committees that address regulatory aspects, legal issues, environmental and economic factors, and public acceptance of nuclear waste management. Multiple expert and working groups focus on backend safety for various geological formations.

When planning long-term licensing projects such as Deep Geological Repositories (DGRs), which span several decades, it is crucial to establish strategies for managing and transmitting relevant information across multiple generations. One key consideration is that technological advancements often outpace regulatory developments. Addressing this challenge requires innovative collaboration in regulatory formulation to ensure the safe implementation of the best available and continuously evolving practices.

1.1.2.5. Tomasz Bury, Silesian University of Technology, Faculty of Energy and Environmental Engineering, PL

The Silesian University of Technology contributes to the development of the Polish economy by researching nuclear-related topics. Experts analyse the safety of spent fuel and radioactive waste management.

In Poland, operational waste from the Maria research reactor has provided valuable opportunities to learn and refine waste management practices. The reactor's Long-Term Operation (LTO) implementation has introduced requirements for updating these plans. Additionally, the planned new reactors will require expanded waste management capacity.

Experience has shown that gaining public acceptance for new waste management facilities is one of the most critical enablers for socially coherent fleet development. The planned plants will operate for decades, while digital technologies continue to evolve rapidly. This presents both challenges and opportunities, particularly in advancing monitoring methods.

New plants must integrate the latest material life-cycle knowledge and surveillance insights, enable cost-efficient structural upgrades, and allow future enhancements to redundant instrumentation and control (I&C) systems, ensuring the feasibility of potential LTO programs in the future.

1.1.2.6. Christophe Bruggeman, SCK-CEN, EURADSCIENCE, BE

SCK-CEN has extensive on-site research infrastructure that fosters innovation, including the BR1-3, HADES, VENUS, and LHMA research facilities. Some of this infrastructure is currently undergoing Long-Term Operation (LTO) planning to extend its capabilities for the next decade. Certain long-term research facilities are used for LTO research, such as pioneering studies on deep-clay formations in Deep Geological Repository (DGR) development. Mature LTO programs involve large-scale, long-term investment initiatives, with SCK-CEN's program planned through 2040.

Additionally, the Chief Scientific Officer of EURAD2 leads the largest European effort in safety research, integrating findings from EURAD1 and PREDIS to complement other EU initiatives. The first DGR operations in Posiva are set to begin soon, providing a valuable model for advancing similar projects elsewhere.

The work is structured across three distinct branches: Waste Management Organizations (WMO), Technical Safety Organizations (TSO) & Research Entities (RE).

1.1.3. Take-aways

Any nuclear energy lifecycle scenario inevitably leads to waste management responsibilities. Decommissioning is estimated to generate roughly half of the total lifetime waste volume, with operations contributing the other half. Decommissioning requires intermittent storage facilities, transportation arrangements, material characterization and inventory management, all supported by reliable data systems.

In the case of Long-Term Operation (LTO), both low- and high-level operational waste volumes will increase. The chosen waste management strategies—whether fuel recycling or Deep Geological Repository (DGR) disposal—will influence the types of waste generated and impact backend infrastructure requirements. LTO decisions will also affect backend processes, depending on the status of the nuclear power plant project in question and the existing waste management infrastructure.

Currently, there is a growing focus on new-build projects and innovative fourth-generation reactors. These projects come with additional waste management facility requirements. However, waste management infrastructure faces the lowest levels of public acceptance, making early-stage public approval a critical factor in new nuclear projects. The earlier waste minimization strategies and long-term survey studies are considered, the easier it will be to address fourth-generation backend challenges.

International collaboration is essential to deploying globally recognized best practices. Numerous ongoing international projects are improving LTO and backend safety, including FRACTESUS, APAL, INCEFA-SCALE, ACES, METIS, STRUMAT-LTO, MAGIC-RR, AGE RR, CAMIVVER, DELISA-LTO, EVEREST, EL-PEACETOLERO, FIND, ISIR AGE, iWELD, INNOV-NDE, PASTELS, GO-VIKING, EURAD-2, PREDIS, and DORADO.

These projects contribute to advancements in diagnostics and simulation methods, material aging and structural integrity surveillance, fracture and fatigue evolution analysis, DGR deployment, long-term behaviour studies of third- and fourth-generation reactor fuels, engineering barrier assessments, and digital safety case development through Building Information Models (BIM). All these fields benefit from well-designed, harmonized, and long-term data management and sharing practices.

There are ongoing working groups exploring international waste management practices and facility possibilities. However, significant challenges remain in harmonizing global waste management practices, including differences in national waste classification, acceptance criteria, waste minimization strategies, data management systems, and geological characteristics of proposed DGR sites. Extensive research, harmonisation efforts, and collaborative learning are still needed across all forms of international cooperation.

1.2. Parallel session – The European Alliance to develop, demonstrate and deploy SMRs by early 2030s

This parallel session was moderated by **Fabio Nouchy** (Italian YGN, Tractebel BE, INYG) and **Angelgiorgio Iorizzo** (EC DG RTD).

The panellists were:

- **Peter Baeten**, Director-General, SCK-CEN, BE
- **Olli Kymäläinen**, Technical Director, Fortum, FI
- **Virginie Wasselin**, Chef du service stratégie filières, ANDRA, FR
- **Ghislain Pascal**, Policy Officer, DG ENER, EC
- **Hidde Baars**, Director Government Affairs NL and EU, URENCO, NL
- **Jan Prasil**, Director, Ministry of Industry and Trade, CZ

1.2.1. Scope

The session provided an overview of the EU Small Modular Reactor (SMR) Industrial Alliance, highlighting its current status, recent developments, and the progress made.

1.2.2. Summary of technical session

1.2.2.1. Ghislain Pascal, DG ENER, EC

The session began with a general presentation on the EU Small Modular Reactor (SMR) Industrial Alliance, offering a short summary of its formation and current status. The Alliance was officially launched in February 2024, following a pre-partnership phase involving SNETP and nucleareurope, with strong support from the European Commission.

Today, the Alliance counts 346 members and encompasses five SMR technology families, representing a total of 28 different designs. Its core objective is to facilitate and accelerate the development, demonstration, and deployment of SMR projects in Europe, with a target timeline set for the early 2030s. The emphasis is firmly placed on advancing concrete projects.

The governance structure of the Alliance was also presented, including the Governing Board and the Secretariat, which brings together representatives from DG ENER, DG GROW, DG RTD, the Joint Research Centre (JRC), SNETP, and nucleareurope.

The Alliance is structured around two main pillars: eight technical working groups and an initial batch of nine project working groups, all aimed at driving forward the industrial and technological readiness of SMRs in Europe.

1.2.2.2. Peter Baeten, SCK-CEN, BE

The session included an update on the work of Technical Working Group 2 (TWG2), which is focused on the development of the Technology and R&D&I. TWG2 currently brings together 125 members and is organized into seven sub-groups, each addressing specific thematic areas.

Action plan has been developed to support and respond to the needs and questions raised by the Project Working Groups (PWGs). It includes a set of around 70 actions that have been carefully cross-checked against both ongoing and completed European projects to ensure alignment, avoid duplication, and build on existing knowledge and progress.

In the end, these actions have been consolidated into 10 overarching key actions:

1. To identify **gaps in applying the current European codes and standards** for light water SMRs and to accelerate the development new ones for AMRs: **designate and reinforce their ownership by an EU organisation**.
2. To evaluate **the availability and the cost** of building a "**European data source centre**" (accessible for the European alliance members) that pools the existing datasets currently under proprietary restrictions.
3. To leverage trans-national access to **experimental facilities** by implementing financing mechanisms across the EU
4. To simplify the **export control** within the EU to facilitate transnational cooperation.
5. To identify together with the PWGs **the needs for (integral, partial-integral, etc.) tests** necessary for licensing of each design under development and to select the partners and facilities where these tests can be performed.
6. To define an EU action plan and timeline for implementation of **securing fuel supply for EU for the PWG's within the EU**.
7. To execute the necessary experimental investigations to qualify **innovative techniques for construction** (e.g., Steel-concrete(-steel)), for the modular design of SMRs.
8. To draft a recommendation document for the **assessment of passive systems** to come to a shared EU reference methodology and safety approach for all PWG's.
9. To identify short-term, value-driven innovation in **digitalisation**, prioritizing high-impact initiatives that deliver practical benefits.

10. To investigate the critical issues concerning **coupling of SMRs to other systems (heat to X)**, covering technical, economical security and licensing challenges and to define the need for non-electrical application demonstrators together with end-users.

1.2.2.3. Olli Kymäläinen, Fortum, FI

The presentation on Technical Working Group 6 (TWG6) focused on safety and safeguards, highlighting the key challenges associated with the deployment of SMRs and AMRs. Among the key issues identified were the complexities of licensing and safety assessment across different national frameworks, and the need to enhance safety and licensing readiness for new reactor types. TWG6 also emphasized the importance of addressing safeguards and security concerns specific to innovative reactor designs. In addition, non-nuclear regulatory requirements—such as fire safety, occupational safety, and other national standards—were recognized as critical factors that vary significantly between countries. The group is also working on assessing and mitigating risks from external industrial hazards and considering emergency planning zones (EPZ) and radiological impact in the siting of SMRs.

To effectively address these diverse topics, TWG6 is organized into six subgroups, each dedicated to one of the identified challenge

Action plan has been developed for each subgroup:

- To develop industry position paper on nuclear safety issues for SMRs;
- To organize workshops for AMRs to raise awareness and engage EU regulatory authorities;
- To improve the availability of information to SMR developers regarding security and safeguards issues;
- To develop industry position papers on non-nuclear safety issues for SMRs;
- To assess risks caused to SMRs by nearby industrial facilities and vice-versa;
- Any other support needed for PWGs.

The group's ways of working emphasize close interaction with the ENSREG SMR Task Force, active cooperation with the Project Working Groups (PWGs) and other Technical Working Groups (TWGs), and alignment with broader international activities.

1.2.2.4. Hidde Baars, Director Government Affairs NL and EU, URENCO, NL

Mr Baars gave an update from Technical Working Group 7 (TWG7), which focuses on nuclear fuel and radioactive waste management. A key challenge identified by the group is the need for the nuclear fuel cycle to adapt to a growing and diverse demand for fuel types, particularly in light of the projected tripling of nuclear capacity promised at COP 28.

TWG7 currently includes 70 members and is organized into three subgroups: one addressing existing and new front-end capabilities, another focused on fuel manufacturing, and a third dedicated to used fuel and waste management.

The high-level conclusions of TWG7's Action Plan emphasize several strategic priorities. First, it is crucial to reduce reliance on non-reliable suppliers, such as Russia, to ensure supply chain security. Second, an agile and predictable regulatory framework is needed to support innovation and deployment. The group also highlighted the importance of establishing a common framework for assessing technological readiness across different fuel types and reactor designs.

In terms of waste management, TWG7 underlined the need for comprehensive solutions for spent fuel, including recycling, reprocessing, and final storage. The EU is well-positioned in this area, as it is already home to several key elements of the nuclear fuel cycle infrastructure.

1.2.2.5. Virginie Wasselin, ANDRA, FR

The presentation addressed the challenges related to the management of radioactive waste from SMRs and AMRs. In France, an innovative nuclear reactor support program has funded 11 SMR/AMR projects, exploring different technologies and fuel types. This diversity introduces new complexities for future waste management, particularly in ensuring compliance with waste acceptance criteria—especially for novel waste forms such as salt- or sodium-based materials.

One of the key concerns raised was the compatibility of these new fuel types with existing or future back-end facilities for nuclear waste handling, including storage, transport, and disposal. As these technologies evolve, it is essential to assess whether the resulting waste streams can be safely and efficiently managed within the current infrastructure or if new solutions will be required.

A central message from the discussion was the importance of maintaining an open and continuous dialogue with all relevant stakeholders. This proactive engagement is critical to avoid creating additional burdens for future generations and to ensure that waste management strategies are integrated from the outset.

1.2.2.6. Jan Prasil, Ministry of Industry and Trade, CZ

The presentation on the implementation of the Czech Republic's Small Modular Reactor (SMR) Roadmap, offered insights from a governmental perspective. Sensitivity analyses of future energy scenarios indicate a need for repowering as early as 2030, with an estimated requirement of 3 GW. The probable scenario foresees a 2+2 configuration of large nuclear power plants at Dukovany and Temelín, complemented by SMRs at Temelín and additional sites. This vision is outlined in the Czech SMR Roadmap published in 2023.

SMR developers are actively seeking state aid, and there is a strong emphasis on involving Czech companies in the emerging SMR supply chain. The Czech government is closely monitoring international developments, particularly in Canada, the United States, and other European countries, to align its strategy with global best practices.

Support for domestic research is a key priority. It was mentioned successful international collaboration between French, Czech, and Finnish regulators on the first phase of the Nuward design review, and cooperation with the UK's Office for Nuclear Regulation (ONR) is ongoing for the Rolls-Royce SMR design.

2025 activities include deeper involvement in the EU SMR Industrial Alliance, participation in trade missions and international conferences, and the initiation of negotiations for state aid mechanisms to support SMR deployment. The Czech Republic is also working to accelerate SMR development under the Net-Zero Industry Act (NZIA) and is engaged in negotiations with Rolls-Royce and Orlen regarding the BWRX-300 technology.

Czech Republic is also part of the broader IPCEI SMR initiative.

1.2.3. Take-aways

Conclusions:

- The SMR Industrial Alliance offers a valuable framework for aligning European R&D&I efforts, but the next phase demands a stronger focus on delivering research outcomes that directly support project deployment.
- Engaging political stakeholders with evidence-based insights remains essential to inform policy design and secure long-term institutional support.
- Cross-disciplinary and cross-border collaboration is critical – particularly to harmonize methodologies, accelerate technology qualification, and streamline safety and licensing processes.
- Enhancing Europe's resilience in the nuclear domain will require coordinated research on secure fuel supply chains, new fuel types, and associated waste management solutions.
- Early-stage collaboration between researchers and SMR developers is vital to co-design experimental campaigns, simulation models, and digital tools tailored to licensing and operational needs.
- EU-level coordination is needed to ensure timely access to shared experimental infrastructure, reliable data repositories, and predictable funding streams that can support high-impact research aligned with deployment goals.

1.3. Parallel session – Nuclear New Build in Europe

This parallel session was moderated by **Baptiste Pothet** (Framatome, FR) and **Alexandre Havard** (French YGN, SFEN JG).

The panellists were:

- **Andrzej Sidło**, Counsellor to the Minister, Ministry of Industry, PL
- **Lou Martinez**, CTO and Executive Vice President of R&I, Westinghouse, ES
- **Juha Poikola**, Manager and Public Relations, Teollisuuden Voima Oy, FI
- **Pascal Charles**, Directeur R&D Production & Ingénierie, EDF, FR

1.3.1. Scope

The session provided an overview of the design, construction, and start-up of new nuclear power plants (NPPs), as well as lessons learned.

1.3.2. Summary of technical session

The session began with an opening by the moderators. Baptiste Pothet provided an overview of new NPP builds in Europe and addressed relevant issues. The session offered a comprehensive overview of the latest, ongoing, and future NPP builds in Europe, offering lessons learned from all stages of the process. The panel was composed of designers, utility providers, and government representatives.

1.3.2.1. Lou Martinez, Westinghouse, ES

Mrs. Martinez presented the Westinghouse portfolio of nuclear technology and services. Westinghouse offers a wide range of products, including the AP1000® reactor, the AP300™ SMR, energy storage solutions, and the eVinci™ microreactor. Westinghouse's comprehensive services encompass all aspects of the nuclear operating plant lifecycle.

Regarding the large units, there are currently six AP1000 units in operation and twelve AP1000 units under construction.

Westinghouse utilizes the NEXUS platform for the evaluation and optimisation of design changes. The changes and innovations should prioritise simplification and standardisation of the design and construction. Westinghouse employs a partial modularization approach even in the case of large units.

Mrs. Martinez emphasised that full digitalisation facilitates communication with suppliers and streamlines construction processes.

1.3.2.2. Pascal Charles, EDF, FR

Mr. Charles started his presentation with a historical reminder, that France itself was able to build and commission 4-6 NPPs per year in the 1980-ties.

Negative effect of the gap in NPP construction, when the FL3 construction permit was issued 16 years after the previous one.

The restart of construction of NPPs has been impacted by various factors, including the FOAK effect and disruptions of supply chains. Also, the Fukushima accident had a significant impact on the licensing and construction of the FL3, when it happened in the midst of the licensing and construction process.

Lessons learned from construction of the first EPRs led to optimization of the design to simplify the construction process, while retaining the safety characteristics. This process has resulted in EPR2. In addition to the design simplification, the major changes were focused on standardization, digitalization, improved organization, construction modularity and prefabrication, and supply chain integration.

Mr. Charles has informed us that there are six EPR2 + 8 in option to be realised by 2050. In addition to the EPR2, the EPR1200 design was developed to meet the needs of medium-sized nuclear power plants (NPPs).

The necessity of constructing new units is supported by the fact that the average age of France's 57 reactors is 38 years.

The higher number of units to be constructed and their construction in pairs have a positive impact on various aspects of business operations, including construction, supply chain management, and the development of human resources.

1.3.2.3. Juha Poikola, Teollisuuden Voima Oy, FI

Mr. Poikola presented on the experience gained during the licensing, construction, commissioning, and initial years of operation of Olkiuloto3 (EPR) NPP.

He began with a concise overview of the OL3 construction project, including the issuance of the construction permit in 2005 and the commencement of commercial operations in 2023.

The OL3 plant was financed according to the Makala principle, meaning that the government did not participate in the financing of the construction.

The initial two years of operation proved to be highly successful, with only minimal technical issues (two days of downtime). Presently, the OL3 is preparing for the 18-month campaign operation.

Mr. Poikola reported that the level of public acceptance and support for nuclear power in Finland is very high. This is noteworthy because even the Finnish Green Party supports nuclear power based on their climate research.

Furthermore, he underscored the significance of attaining harmonization within the EU market.

1.3.2.4. Andrzej Sidło, Ministry of Industry, PL

The Polish government initiated 2006 feasibility study suggested it optimal to build an 11.5 GWe capacity nuclear power plant. Both the government and industry companies plan deployment of nuclear power.

The government is planning construction of NPP at 2 sites, when the AP1000, APR1400 and EPR are the main candidates to be chosen.

At the same moment the Polish chemical industry is preparing the licensing and construction of BWRX-300 SMR at several sites of Poland and potentially also in other EU countries.

The Polish government and organizations paid close attention to analyses of the latest new NPP builds and their problems. Furthermore, only the proven technologies have to be chosen.

Mr. Sidlo provided commentary on the inadequate harmonization of technical standards within the nuclear industry in Europe. He also noted that the standards should be technology-neutral.

There is a high level of public acceptance and support for nuclear power in Poland. Mr. Sidlo concluded that the figure would be even better if licensing and construction were to proceed at a faster pace.

1.3.3. Take-aways

In the session titled "**Nuclear New Build in Europe**," participants engaged in a transparent and constructive dialogue, addressing both the successes and challenges encountered.

The session highlighted both the achievements and challenges associated with the construction of new nuclear power plants (NPPs) in Europe. One of the main issues identified was the long gap in NPP construction, which led to a loss of industrial know-how and was further complicated by first-of-a-kind (FOAK) effects, supply chain disruptions, and regulatory impacts such as those following the Fukushima accident.

However, key lessons have been learned from recent projects, particularly regarding design simplification, standardisation, digitalisation, modular construction, and supply chain integration. These improvements aim to streamline future builds and reduce complexity and risk.

Constructing NPPs in pairs was shown to have positive effects on efficiency, workforce planning, and cost management. The importance of harmonising regulatory and technical standards across Europe was also underlined, with an emphasis on technology-neutral approaches to avoid unnecessary design modifications.

Finally, public acceptance of nuclear energy is increasing, especially where it is linked to climate and energy security goals. Continued progress in licensing and construction timelines is seen as essential to maintaining and strengthening this support.

The relevant knowledge gained from designing, licensing, and constructing large units is also applied to the design and construction of SMRs.

2. Plenary session II "Enablers for Innovative nuclear, strengthening the EU strategic competitiveness and autonomy"

Building on the discussions of Plenary Session II entitled "**Enablers for Innovative nuclear, strengthening the EU strategic competitiveness and autonomy**", the three following parallel technical sessions focused on technological innovation, industrial capabilities, and regulatory advances that can enhance Europe's leadership and resilience in the nuclear domain. The sessions showcased current European projects and explored strategies for fostering innovation and securing Europe's strategic autonomy in the nuclear field.

2.1. Parallel session – Innovative nuclear fuel cycles and materials strategies

This parallel session was moderated by **Mykola Dzubinsky** (EC DG RTD) and **Pau Aragon** (Spanish YGN, Jovenes Nucleares).

The panellists were:

- **Lorenzo Malerba**, Profesor de Investigación Materiales, CIEMAT, ES
- **Virginie Solans**, NAGRA, CH
- **Hugues Hinterlang**, Head of EU Public Affairs, Orano Group, FR
- **Paul Schuurmans**, Scientific Adviser, SCK-CEN, BE
- **Szavai Szabolcs**, Head of Department, AEMI, HU
- **Véronique Rebeyrolle**, Fuel BU R&D and IP Senior Manager, Framatome, FR

2.1.1. Scope

Innovations in fuel cycle (Accident-Tolerant Fuels, advanced and innovative fuel types, MOX and others, HALEU, multi-recycling, closed fuel cycles), in radioactive waste management (minimisation towards a circular economy) and in materials (high temperature, corrosion resistant).

The intent is to eventually touch base with the following:

- Innovative nuclear fuel cycles and advanced materials are crucial for improving the safety, efficiency, and sustainability of nuclear energy.
- Developing advanced fuel types and optimising fuel cycles can help minimise radioactive waste and support a circular economy in the nuclear sector.
- Accident-Tolerant Fuels (ATFs) enhance reactor safety by preventing radiation release during severe accidents, using materials like coated zirconium cladding and silicon carbide composites.
- Advanced fuel types such as Mixed Oxide fuels (MOX) and High-Assay Low-Enriched Uranium (HALEU) improve resource efficiency and enable longer fuel cycles.
- Thorium-based fuels offer potential benefits like reduced long-lived radioactive waste and greater abundance, though challenges remain.
- Multi-recycling and closed fuel cycle strategies maximise resource utilisation by reprocessing spent fuel to recover valuable materials like plutonium and uranium.
- Advanced reprocessing technologies, such as Partitioning and Transmutation (P&T) and pyro-processing, significantly reduce waste radiotoxicity and storage needs.
- Optimised fuel fabrication techniques and Lifecycle Assessment (LCA) help minimise radioactive waste and improve long-term storage solutions.

- High-temperature and corrosion-resistant materials are essential for advanced reactors like High-Temperature Gas-cooled Reactors (HTGRs) and Molten Salt Reactors (MSRs).
- International cooperation and policy support are necessary to fully realise the benefits of innovative nuclear fuel cycles and materials strategies.

Relevant EU funded projects:

ANSELMUS * ADV. HLM safety assessments, PATRICIA * FC P&T Myrrha, TRANSPARANT * FC P&T Myrrha towards industrial application, INNUMAT * ADV. Innovative Materials FU/FI, NUCOBAM * II-III Materials Additive Man. Components, CONNECT-NM * ADV. MAT Partnership, PUMMA * FC Fuel Pu management, FREDMANS * ADV. FC Nitride Fuels, OperaHPC * FC eATF Thermomechanical tools, SCORPION * II-III ATF Accident-tolerant fuels, EURAD * WM EJP Waste EURAD, PREDIS * WM Pre-disposal management, EURAD-2 * WM CSFD: Criticality SAfety for Final Disposal, EURAD-2 * WM Partnership SAREC: Release of safety relevant radionuclides from spent fuel under deep disposal conditions.

2.1.2. Summary of technical session

In this session, the panellists addressed the proposed sub-topics:

2.1.2.1. Generic question 1 to all the panellists

Different strategies coexist when it comes to innovative fuel cycles or materials, some being more driven by an incremental progress and some seeking for game-changers. What are main steps - whether they are technological, safety and regulation or societal - do you believe the sector should take to implement and bolster innovation for fuel strategies?

Panellists emphasised a dual-track approach to innovation: combining incremental improvements with game-changing strategies. Key steps identified include:

- Paradigm Shift in R&D: A transition from “observe and qualify” to “design and control” was advocated, particularly in materials science. This involves leveraging digital tools (e.g., high-performance computing, AI, semantic technologies) to accelerate material and fuel development as other industries do
- Accelerated Qualification Pathways: While qualification remains essential, smarter and faster methods—supported by regulators and standardization bodies—are needed to reduce time-to-deployment for new materials and fuels.
- Regulatory and Societal Engagement: Public acceptance and regulatory clarity are critical. Countries like Switzerland highlighted the need for societal buy-in, especially where nuclear bans exist. Harmonized EU-wide regulatory frameworks were seen as enablers of innovation.
- Infrastructure and Skills: Investment in testbeds, irradiation facilities, and workforce development is essential to support both near-term deployment of advancement supporting life extension of current (PWR, BWR) fleet but also break through innovation in fuel, supporting GenIV reactor designs.

Strategic Coordination: EU partnerships like CONNECT-NM were praised for fostering collaboration, avoiding duplication, and aligning research with industrial needs, and as demonstrated throughout the past 2 decades of EU supported projects. This is what allowed to building the strong fundamentals of knowledge that we have today to be able to project current fleet in LTO, and this is this continuous support and collective effort that will help us support GenIV developments as well.

2.1.2.2. Advanced Fuels

"Advanced fuels like HALEU, MOX, and ATFs are central to present and future reactor concepts and fuel cycle strategies. In your area of expertise, what are the most promising fuel innovations to enable closed fuel cycles or enhance reactor safety, and what technical or supply chain hurdles must still be overcome?"

Panellists identified several promising fuel innovations:

- Accident-Tolerant Fuels (ATFs): Already being deployed in evolutionary reactors, ATFs (e.g., chromium-coated cladding, etc) enhance safety margins and are ready for near-term implementation to allow LTO by increased safety margin. Progress in terms of increased burn ups etc are likewise incremental innovations allowing for LTO of current fleet, as well as being technology bricks that are also useful for future designs of fuels for GenIV.
- Mixed Oxide Fuels (MOX): Enable plutonium reuse and are central to a strategy for closing the fuel cycle. MOX is mature and industrially supported but requires robust reprocessing infrastructure. It should set the basis for the design of multi-cycling into GenIV (fast) reactors.
- High-Assay Low-Enriched Uranium (HALEU): Essential for many SMRs and Gen-IV reactors. However, supply chain limitations—particularly enrichment and fabrication capacity—pose significant hurdles.
- Multi-Recycling and Fast Reactors: Fast reactors using MOX or metallic fuels are critical for achieving true fuel cycle closure. These require further development and demonstration, including advanced reprocessing technologies.

Strategic Gaps: Panellists stressed the need for industrial-scale demonstration projects (e.g., pre-industrial engineering platforms) to bridge the gap between lab-scale innovation and commercial deployment. This might come with a significant increase in capex intensive activities but is required to achieve our collective goals.

2.1.2.3. Structural materials

“Materials are often among the key bottlenecks for next-generation reactors - this is especially true for LFR and MSR, which are the focus of several European start-ups. Even for LW-SMRs, materials challenges persist, particularly in relation to the advanced manufacturing techniques required for modular (and faster/cheaper) construction. In this context - and in an era marked by efforts to extend the lifetimes of existing reactors - how should we reframe the role of materials R&D?”

Materials R&D must evolve to meet both near-term and long-term challenges:

- Dual Focus: Materials R&D should support both the lifetime extension of existing reactors and the development of materials for advanced reactors (e.g., S&LFRs, MSRs, HTGRs). These require high-temperature, corrosion-resistant, and radiation-tolerant materials…

- Digital and Integrated Approaches: A shift toward integrated, digitally enabled R&D was advocated. This includes using AI, modelling, and high-throughput experimentation to accelerate FAST discovery on “safe by design” materials for fuels applications, BEFORE engaging extensive qualification.

- Additive Manufacturing: Seen as a key enabler for future designs, additive manufacturing introduces new material behaviours that must be understood and qualified, but is seen more as an incremental innovation to manufacture fuels with known materials.

- Holistic Lifecycle Perspective: Materials must be designed with their entire lifecycle in mind—from fabrication and operation to recycling and disposal.

Collaboration and Infrastructure: Shared databases, testbeds, and coordinated EU projects are essential to accelerate progress and avoid effort duplication.

2.1.2.4. Spent fuel

"Spent fuel management is a major challenge for long-term sustainability. From your perspective, what technological or strategic advances - whether in long-term storage, transmutation, or waste form development - show the most potential to reduce environmental and radiological burdens?"

Panellists highlighted several complementary strategies:

- Reprocessing and Recycling: Technologies that recover up to 96% of usable material from spent fuel (e.g., MOX fabrication, advanced PUREX processes) significantly reduce waste volume and radiotoxicity.
- Partitioning and Transmutation (P&T): Using fast reactors or accelerator-driven systems (e.g., MYRRHA) to transmute long-lived isotopes into shorter-lived ones offers a path to reduce the burden on geological repositories.
- Standardized Waste Forms: Development of durable waste matrices (e.g., vitrified forms) and standardized containers facilitates long-term storage and international cooperation.
- Direct Disposal Strategies: Countries like Sweden are advancing deep geological repositories (DGRs) with multi-barrier systems. Innovations focus on canister materials, buffer optimization, and digital twin modelling for repository design.
- Holistic Optimization: Lifecycle and system-level optimization—using tools like digital twins—can improve repository design, reduce excavation needs, and enhance safety.
- Strategic Imperative: Reducing uranium mining through better fuel utilization and recycling was emphasised as a key environmental priority.

2.1.3. Take-aways

Accelerating innovation through a dual-track strategy supports both:

- Incremental improvements (e.g. ATFs, MOX, HALEU) for near-term deployment in existing reactors to support their long term operation and will be used as techno bricks for upcoming designs (HALEU & Triso for SMRs and AMRs, etc..)
- Game-changing innovations (e.g. multi-recycling, fast reactors, advanced materials) for long-term sustainability and fuel cycle closure, in S&LFRs, and MSRs.

This requires funding both mature technologies ready for industrialisation and exploratory R&D that can deliver breakthroughs. It is therefore imperative to:

- Invest in infrastructure and accelerated qualification pathways to reduce time-to-market for new fuels and materials:
- Expand access to irradiation facilities and testbeds, hot cells, and modelling tools.
- Support the development of accelerated qualification methodologies in collaboration with regulators and standardization bodies.

- Promote shared EU-wide infrastructure and databases to avoid duplication and foster collaboration.

Enable a Circular Nuclear Economy to align nuclear innovation with the EU's sustainability and circular economy goals by prioritizing technologies that:

- Reduce uranium mining and radioactive waste through reprocessing, recycling, and transmutation.
- Support closed fuel cycles using fast reactors and advanced reprocessing
- Develop durable waste forms and optimize repository design using digital tools and lifecycle assessments.
- Address bottlenecks in high-temperature, corrosion-resistant, and radiation-tolerant materials for Gen-IV reactors (e.g. LFRs, MSRs).
- Strengthen Materials R&D for Advanced and Modular Reactors

Support a new paradigm in materials research:

- Shift from "observe and qualify" to "design and control" using AI, modelling, and high-throughput experimentation.
- Insure Strategic Sovereignty and Industrial Readiness
- Secure European supply chains for critical materials like HALEU and MOX.
- Support industrial-scale demonstration projects to bridge the gap between lab-scale R&D and commercial deployment.

Foster public-private partnerships and align funding instruments (e.g. Euratom, EIB, IPCEIs) to de-risk investments and maintain EU technological leadership.

2.2. Parallel session – Artificial intelligence and digital technologies for safe and sustainable nuclear activities

This parallel session was moderated by **Eero Vesaoja** (Fortum, FI) and **Keziah Garba** (Women in Nuclear YG).

The panellists were:

- **Istvan-Réka Szöke**, Deputy Director, Head of Applied Physics, IFE, NO
- **Jani Halinen**, Head of Nuclear Energy research, VTT, FI
- **Patrick Morilhat**, Director of R&D, EDF, FR
- **Anders Wik**, R&D Manager for Nuclear and Digitalization, Vattenfall, SE
- **Nelly Ngoy Kubelwa**, Division of Nuclear Power, IAEA

2.2.1. Scope

The panel discussion on artificial intelligence (AI) applications in the nuclear industry brought together experts from various sectors, including the IAEA and leading nuclear energy organizations. The session examined the nuclear sector initiatives to enhance AI implementation in nuclear operations, highlighting both the supportive resources and the challenges, such as data integrity, lack of industry-specific standards, and regulatory compliance. Panellists discussed their experiences with AI applications, including predictive maintenance and digital twins. They emphasized the integration of AI with other technologies, such as robotics and extended reality. Recommendations for future advancements included enhancing data sharing, focusing on autonomous operations, and fostering a human-centric approach to technology adoption to attract new talent.

2.2.2. Summary of technical session

During this session, five different topics were addressed by panellists to understand how the nuclear sector is adapting to digital technologies and artificial intelligence.

2.2.2.1. Topic 1: What challenges does AI present in our industry and what can be done to address these challenges?

The discussions highlighted several key challenges related to integrating artificial intelligence into regulated industries, particularly the nuclear sector.

The most important consideration is the quality and reliability of the information. It is essential to use trustworthy, relevant, and varied sources while ensuring the accuracy, comprehensiveness, and relevance of the data.

The production and sharing of sensitive data, such as incident reports, must be handled with care and confidence. AI systems must be transparent and easy to understand, and their behaviour must be evaluated in secure testing environments. This issue of opacity in commercial models and the potential for bias remains a significant challenge for public acceptance (by the workforce, regulators, and civil society).

Data security, sovereignty, and infrastructure limitations pose significant obstacles, especially when relying on external cloud providers. Internal solutions and local infrastructure are seen as preferable to ensure control over data. We need to find a way to deal with data integrity and safeguarding against manipulation.

The current regulatory frameworks do not fully align with the capabilities and risks of AI, necessitating updates and harmonization in collaboration with safety authorities.

The development and improvement of workers' skills are essential, not only for the deployment of artificial intelligence tools but also for adapting to the evolution of jobs. Carefully managing the technical integration of AI into industrial processes and robotics, considering its economic feasibility and profitability, is crucial. Additionally, it is important to identify high-value use cases and promote uniformity in the industry to prevent fragmentation and ensure a unified implementation.

2.2.2.2. Topic 2: What potential benefits does AI offer for our industry?

Artificial intelligence is gaining recognition for its value in different phases of the nuclear industry and research.

Its primary strength is making it easier for people to find information, even if the data is spread out across multiple, complicated, and disconnected resources, including reports, blueprints, and specialized materials. Artificial intelligence (AI), which includes advanced tools such as large language models, data analysis, and identification systems, is employed for comparing and verifying data from various sources. This enhances the trustworthiness of the results. Additionally, AI is utilized in image recognition for microscopy, quality control, and research planning. This approach could offer a quicker and more precise alternative to traditional techniques. These applications have the potential to generate significant cost savings and accelerate materials development.

In the fields of engineering and project management, artificial intelligence (AI) assists in coding, requirement monitoring, and computational duties.

During the entire life cycle of nuclear facilities, from building and operation to maintenance and long-term operation, AI could be employed for a range of responsibilities, including non-destructive testing, document analysis, and supply chain management. It also helps with education and training.

For new reactor designs, such as SMRs and AMRs, AI integration during the design process presents opportunities for optimization of performance, safety, and efficiency.

2.2.2.3. Topic 3: What are the benefits of digital twins, and how can they be used?

Digital twins are increasingly used in the nuclear industry for various purposes, such as process simulation, training and maintenance. However, there is a need to assess and qualify digital twins in safety studies, as their reliability is not yet fully established. These instruments are also crucial in linking virtual simulations with real-world settings, as evidenced by their application in monitoring the functioning of Ukrainian facilities. Nuclear industries are exploring digital twins for both new and existing plants.

For older facilities, they help with monitoring, behavioural analysis, and predictive maintenance. They are especially useful if component specifications are available, making them more accessible and verifiable than some other technologies. Digital twins can be used to model and optimize plant operations, monitor sensor data, plan future modifications, and even incorporate virtual reality for enhanced interaction. They could support decision-making by simulating component behaviour and transient events, and can serve as companions to evaluate strategies and actions. They are also useful in decommissioning projects, which involve complex logistical planning.

For new designs, they assist in system validation, architectural planning, and characterization of components.

In training, digital twins are used to simulate control rooms and operational scenarios. This can be done when the physical training infrastructure is outdated or insufficient. They also facilitate maintenance planning by taking into account plant modifications, updated circulation rules, and new sensor configurations, ensuring that personnel are equipped to handle real-world conditions.

2.2.2.4. Topic 4: How can AI be combined with other technologies, and what impact does this have on its use cases?

Artificial intelligence is increasingly being integrated into robotics, simulation, and operational environments, leading to more autonomous, intelligent, and adaptable systems.

Robotics is progressing towards increased self-reliance, fuelled by AI-driven functionalities like image processing for error identification, audio recognition, and conversational interfaces. These technologies are often combined with drones and humanoid robots, and are becoming routine in detection and recognition tasks. This allows for collaborative workflows among various resources, while AI facilitates cutting-edge manufacturing, notably through the automation of part fabrication.

Immersive training is facilitated by XR/VR simulations augmented with artificial intelligence, while AI-driven BIM systems enhance planning and forecasting capabilities. In areas where traditional physics models are insufficient, physics-informed AI offers improved accuracy and insight.

Large language models are also being used to enhance human-system integration by acting as co-pilots, assisting with daily tasks and decision-making. In fusion research, AI is being explored to support plasma control, combining physical modelling with data-driven approaches, thereby accelerating scientific progress.

AI is not limited to machine learning or generative models; it encompasses a variety of approaches tailored to specific needs, such as probabilistic safety assessments (PSA) and engineering process simulations (EPS). These diverse applications demonstrate the potential of AI to improve compliance assurance, particularly in complex methods such as decommissioning, and to enhance technologies such as robotics and extended reality.

2.2.2.5. Topic 5: Discussing Future Possibilities and Recommendations in Digital Technologies

The availability of data is becoming a crucial aspect for research institutions, specifically regarding customer and supplier data. This raises questions about data ownership and management. There is an increasing need for improved data sharing and integration among organizations, facilitated by open standards and flexible digital architectures.

Innovation is not only crucial for fostering a culture of safety and facilitating the introduction of cutting-edge technologies, such as advanced modular reactors and next-generation nuclear designs. It is also essential for attracting a new generation of talent to the industry.

Human factors remain central, with an emphasis on maintaining human oversight, avoiding opaque ‘black box’ systems, and ensuring that AI supports rather than replaces human decision-making.

Regulatory innovation is also key, both in adapting regulatory frameworks to new technologies and in leveraging digital tools within regulatory processes.

The implementation of AI and robotics must be accompanied by robust qualification and verification mechanisms. It is important to focus on the practical value of these technologies rather than innovation for its own sake. Key areas identified include cross-industry knowledge sharing, digitization, and the establishment of self-governing systems, all while prioritizing safety.

2.2.3. Take-aways

The integration of artificial intelligence (AI) and digital technologies, such as digital twins, into the nuclear sector presents a range of opportunities. These innovations have the potential to enhance reactor safety and efficiency.

Digital twins are particularly interesting as they allow for a quick integration of all the events and modifications that a plant or component has experienced, which can help us understand its behaviour. Therefore, they are particularly valuable in workforce training programs. Their insights can greatly enhance new design concepts, specifically during the optimization stages of its structure and functionality.

Artificial intelligence appears to be a valuable tool in the nuclear industry, but it also raises regulatory concerns.

Research indicates that AI has potential applications in various areas, such as facilitating access to information and managing knowledge related to nuclear power plant operations. Additionally, AI can contribute to operational improvements, including enhancing inspection, surveillance, and logistical optimization.

The implementation of AI could enhance the skills of employees through training and provide support for routine tasks. However, the nuclear industry must also be able to integrate the effects of AI on employment and workers.

The primary hurdles to its implementation and use are undoubtedly technical, including questions of generation, learning capacity, and data storage. However, it also presents regulatory challenges. The issues of governance, quality, and reliability of information must be addressed in conjunction with safety authorities, and regulations and standards must be revised to incorporate these new tools. To ensure the necessary transparency and increase the acceptability of these new methods, these challenges must be overcome.

2.3. Parallel session – Solutions to non-electric energy demand including hybrid energy systems

This parallel session was moderated by **Michael Fütterer** (EC JRC) and **Alexis Amachree** (Women in Nuclear Young Generation).
The panellists were:

- **Józef Sobolewski**, Director for HTR Development, NCBJ, PL
- **Michele Frignani**, Nuclear Technology and Safety, Ansaldo, IT
- **Nicola Rega**, Executive Director, Climate Change and Energy, CEFIC, BE
- **Slavica Ivanovic**, SMR Innovation Project Lead, Tractebel, BE
- **Paul Nevitt**, VP Science and Technology at UKNNL, UK
- **Stéphane Sarrade**, Direction des Programmes Énergies, CEA, FR

2.3.1. Scope

Nuclear energy offers significant potential beyond electricity generation by addressing non-electric energy demands through cogeneration and hybrid energy systems. By simultaneously producing electricity and useful heat, nuclear power plants can enhance overall energy efficiency, reduce greenhouse gas emissions, and support energy security. Small Modular Reactors (SMRs) and Generation IV reactors are particularly well-suited for these applications due to their high-temperature capabilities and operational flexibility. Nuclear heat can be used for district heating, especially in colder regions, and to decarbonize energy-intensive industries such as steel, cement, and chemical production. Additionally, nuclear energy enables clean hydrogen production via high-temperature electrolysis or thermochemical processes, and can power desalination plants in water-scarce areas. Cogeneration not only improves economic viability by maximizing energy use and creating diversified revenue streams, but also allows for retrofitting of existing nuclear plants. Strong policy support, streamlined regulation, and cross-sector collaboration are essential to scale deployment. European projects like TANDEM, GEMINI 4.0, and NPHyCo exemplify ongoing innovation in nuclear hybrid energy systems.

2.3.2. Summary of technical session

2.3.2.1. Józef Sobolewski, NCBJ, Poland

Poland's has identified High-Temperature Gas-cooled Reactor (HTGR) as one of the best options to decarbonize its industry in particular the chemical and petrochemical industries. The progress in developing a High-Temperature Gas-cooled Reactor (HTGR) was highlighted. Initiated in 2016, the project is based on a partnership with Japan's JAEA, using their 30MW HTGR as a model. The initiative aims to support cogeneration for district heating, electricity generation, and hydrogen production. Poland has now completed the basic project documentation, marking a key milestone in the reactor's development.

2.3.2.2. Michele Frignani, Ansaldo, IT

Ansaldo Nucleare, an Italian company with a strong international presence, is a key nuclear actor in the Italian landscape and could play a key role in the resurgence of nuclear energy in Italy. Although Italy phased out nuclear power following the 1986 referendum, it is now reassessing its potential, particularly for supplying thermal energy to industry. The national energy strategy envisions up to 8 GWe of nuclear capacity by 2050. Ansaldo is actively involved in several major European initiatives, including NC2I, SNETP, and EU projects such as TANDEM, NPhyCo, etc contributing to the development and deployment of advanced nuclear technologies.

2.3.2.3. Nicola Riga, CEFIC, BE

The European chemical industry faces high electricity costs that can hinder electrification efforts. These costs, mainly from grid access and taxes, are unlikely to decrease or be offset by efficiency gains. On-site energy production is increasingly seen as a way to maintain competitiveness. Small Modular Reactors (SMRs) are a potential solution for providing stable, low-carbon electricity on-site. SMRs offer modularity, standardisation, and deployment in industrial clusters tailored to industry needs. They could enable new partnerships between energy producers and energy-intensive industries. However, uncertainties remain regarding which SMR technologies will meet industry requirements. Rapid technological and regulatory development is essential for industrial adoption. Early engagement between SMR developers and industry is critical to align capabilities and needs. Cefic supports exploring SMRs as part of the chemical sector's transition to climate neutrality.

2.3.2.4. Slavica Ivanovic, Tractebel, BE

Tractebel has several years of experience exploring the potential of Small Modular Reactors (SMRs), conducting in-depth technology assessments and due diligence for developers and clients. The company plays a leading role in major EU projects such as TANDEM and GEMINI 4.0. A key challenge identified is that industrial clients expect rapid deployment timelines and competitively priced energy solutions.

2.3.2.5. Paul Nevitt, UKNNL, UK

The UK has outlined its approach to using nuclear energy for non-electric applications as part of its broader climate goals, targeting net zero emissions by 2050 and a fully clean electricity system by 2030. The government is committed to advancing large, small, and advanced reactors, including the development of a 200 MW thermal reactor equipped with a smart manifold to serve multiple users efficiently.

2.3.2.6. Stéphane Sarrade, CEA, France

Non-electric energy demand represents nearly two-thirds of Europe's of today total energy use. This demand, mainly in industry, heating, and transport, remains heavily reliant on fossil fuels. Decarbonising these sectors is challenging due to high-temperature needs, transport limitations, and energy storage requirements. Hybrid energy systems integrating nuclear energy are emerging as strategic solutions. Small and Advanced Modular Reactors (SMRs and AMRs) are envisaged to serve diverse thermal applications like hydrogen production or desalination. Nuclear energy can support High-Temperature Steam Electrolysis (HTSE) and synthetic fuel production (Nuclear-to-X). CEA is actively developing and demonstrating nuclear-based hybrid systems and is deeply involved in many EU collaborative projects in this area. Cross-sector collaboration and integration with EU research platforms (e.g., SNETP, NC2I) are key. Policy support, funding, and awareness are crucial to scale up hybrid energy system demonstrators. Euratom is encouraged to expand its research and development efforts to cover industrial heat applications, cogeneration technologies, and high-temperature heat storage solutions.

2.3.3. Take-aways

The expert panel discussion focused on rich exchanges on innovative solutions for non-electric energy demand, with a particular focus on the role of nuclear technologies. Six distinguished panellists shared insights into national strategies and industry perspectives, including Poland's development of HTGRs to decarbonise its chemical sector, Italy's renewed interest in nuclear energy with ambitious capacity targets, and the pressing need within the European chemical industry for reliable on-site energy production. The session also highlighted Belgium's experience with SMRs, the UK's commitment to advancing next-generation nuclear technologies, and CEA's integrated vision for non-electric nuclear applications. A recurring theme was the importance of overcoming financing challenges and fostering cross-European collaboration to accelerate deployment. Key recommendations included the targeted advancement of HTGR projects, enhanced efforts to attract and develop talent in nuclear engineering, and the streamlining of funding mechanisms to support demonstration and deployment of innovative nuclear systems.

3. Plenary session III "Empowering future generations and engaging with civil society"

In continuity with Plenary Session III on "**Empowering future generations and engaging with civil society",** the three parallel technical sessions addressed the human and societal dimensions of nuclear R&D. They discussed education and training initiatives, workforce development and stakeholder engagement, while highlighting success stories and European projects aiming to build trust and ensure the sustainable involvement of future generations in the nuclear sector.

3.1. Parallel session – Addressing social, ethical, and cultural factors towards Sustainable Development Goals

This parallel session was moderated by **Jessica Johnson** (Communications & Advocacy Director, nucleareurope UK/BE) and **Hugo Bernat** (Belgian YGN, BNS-YGN).

The panellists were:

- **Florian Rauser**, Vice-President, Federal Office For Radiation Protection, BFS, DE
- **Alena Mastantuono**, Vice-President of TEN, EESC, CZ
- **Tanja Perko**, Researcher, SCK CEN, BE
- **Emilia Janisz**, Consultant, Clean Air Task Force PL
- **Myrto Tripathi**, President, Voices of Nuclear, FR
- **Marco Ricotti**, Professor, Dipartimento di Energia, Politecnico Milano, IT

3.1.1. Scope

By addressing social, ethical, and cultural factors, Europe can effectively transition to a carbon-neutral economy that is inclusive, just and sustainable, taking into account the whole perspective given by the 17 Sustainable Development Goals. Key considerations and strategies must ensure a comprehensive and inclusive approach.

3.1.2. Summary of technical session

In this session, the following topics were addressed, and some led to recommendations:

- Sustainable Development Goals (SDGs)
- Circular economy
- Mining
- Medical uses
- Climate justice
- Societal issues

Sustainable Development Goals (SDGs)

- SDGs are not only a label: important effort for transitioning is occurring in many fields and place, notably for phasing out of coal
- SDGs are socio-technical topic, many human dimensions to be taken into account

- Sustainability is based on three pillars of social, economic and environmental, and it always need to take into account security questions, affordability and concertation possibilities. Conflict between different SDGs can exist.
- Now is the only way to treat the climate long term, because of climate tipping points, as a gram of CO2 avoided today is more important that a gram of CO2 avoided tomorrow.

Recommendations:

- Allow more social and human sciences to study those dimensions
- When addressing SDGs, making sure that all actors have the capacity to participate, no one left aside, all stakeholders included

Circular economy

- The first objective is to minimise the waste and maximise efficiency. Yet circularity can be more expensive sometimes.
- Possible contribution of nuclear to build world of circular economy, through GenIV projects
- Past incidents may remind that even if all aspects are not perfect, nuclear energy can still be a good balance with advantages
- Harpers EURATOM project identified all dimensions of circular economy in nuclear, under social, legal and environmental aspects

Recommendations:

- Contribute to the coal phasing-out projects, notably the Polish one, while anticipating the repurposing of existing jobs

Mining

- All human activities have mining consequences. Nuclear require little mining, because uranium is dense. ISL technique reduces impacts.

Medical uses

- 40 to 50% of cancer treatment go through radiotherapy.
- Millions of EU citizens are treated with radiation each year
- Yet comparing medical radiation with reactors radiation can be inappropriate, as too different objects and contexts

Recommendations:

- Build a shared framework based on radioprotection pillars (justification, optimization, limitation) for addressing different radiation types

Climate justice

- The areas most affected by climate change are the least responsible of climate change, so countries more responsible should be more involved in offering solutions
- Climate justice is future justice, as teaching children of today is adaptation and thinking about children of tomorrow is mitigation.
- Climate activism and SDGs can be seen as risk management strategy

Recommendations:

- Propose a unified methodology of risk management strategy based on SDGs over the different EU institutions

Societal issues

- Result of the poll: central societal issue identified is misinformation and disinformation, coupled with societal polarisation!
- Misinformation, disinformation can be considered as manipulation via communication of partial truths seeming believable.

In terms of security in a conflict, a NPP cannot be stolen and may continue to produce local stability, but it can also be weaponised.

3.1.3. Take-aways

The parallel session "**Addressing social, ethical, and cultural factors towards Sustainable Development Goals**" underlined that the path to a sustainable, carbon-neutral future with nuclear energy demands more than technical solutions; it calls for societal trust, ethical responsibility, and cultural awareness. Discussions highlighted the crucial role of integrating social sciences into nuclear R&D. From circular economy and mining practices to medical applications and climate justice, the session emphasised the need for balanced approaches considering security, affordability, and environmental protection. Combating misinformation and fostering transparent dialogue emerged as essential to engage civil society and empower future generations, securing the nuclear sector's place in achieving the Sustainable Development Goals.

3.2. Parallel session – Cooperation to attract and retain skills and competences and preserve knowledge and expertise

This parallel session was moderated by **Alexandru Tatomir** (BGE, DE) and **Iñigo Gayo de Leon** (Jovenes Nucleares YG, ES).

The panellists were:

- **Michèle Coeck**, Director, SCK CEN Academy, SCK CEN, BE
- **Brian Eriksen**, Team Leader EHRO-N, Euratom Coordination, EC JRC, NL
- **Gabriel Pavel**, Executive Director, ENEN, RO
- **Nawal Prinja**, Technology Director, Amentum, UK
- **Jochen Ahlswede**, Head of Research/International Department, BASE, DE
- **Thibaud Reysset**, Project Director, I2EN, FR

3.2.1. Scope

The new perspectives for nuclear development in Europe will require significant mobilisation from all nuclear sector stakeholders in terms of recruitment, training, and maintaining existing expertise and knowledge.

What new jobs and skills will be needed in nuclear sector by 2030 and even 2050, considering the requirements of next-generation reactor projects and the contribution of new technologies? How can we train the younger generations and current job market participants to meet these new needs? What training and educational opportunities are already available in Europe, and what new training and educational programs will have to be established? How can we convince the younger generations to join the nuclear sector and pursue a career in it? How can we maintain a high level of expertise and knowledge over the more than a century lifecycle of a complete nuclear program, from design to waste storage? What could be the contribution of artificial intelligence in solving these issues? These are the questions debated by experts in session III.2.

3.2.2. Summary of technical session

3.2.2.1. What are the workforce skill requirements in the nuclear sector and how can the data used to identify them be improved?

The growth prospects for nuclear energy in Europe were reaffirmed by the various stakeholders present at the FISA EURADWEST SNETP 2025 Forum in Warsaw. On one hand, work and studies are underway in several European countries to extend the operational life of existing nuclear fleets. On the other hand, a significant number of new nuclear reactor development projects (whether large-scale or small-scale such as SMRs and AMRs) are being considered, including in countries like Poland that currently do not have access to nuclear energy.

The feasibility of these projects will, of course, depend on the financing capacities of member states and their industries, a qualified system of strict safety regulations but above all on the availability of a qualified workforce in both quantity and quality. It is therefore of utmost importance to identify these employment needs—particularly the new jobs and skills that the new nuclear sector will require—and to establish academic and professional training programs tailored to these emerging needs (see the next paragraph for more on this point).

In France, the MATCH study conducted by GIFEN revealed that more than 100,000 people will need to be recruited over the next 10 years. These high figures result from the combined effect of numerous upcoming retirements and the needs associated with the construction of new reactors.

It is important that data related to workforce and skills needs are comparable, whether between different industrial sectors or between national and European levels. The ESCO (European Skills Competences Qualification and Occupation) tool from the European Commission (freely available), offers a link between specific occupation and associated skills and competences.

Studies conducted by the JRC as part of the EHRO-N (European Human Resources Observatory for the Nuclear Sector) as well as research from the United Kingdom, Finland, and France, have highlighted weaknesses in the harmonization of technical vocational training. A system of credits and transferability still needs to be developed through systematic use of “Leaning outcomes” or micro-credentials.

These studies also emphasized the strong need for STEM-type education (Science, Technology, Engineering, Mathematics), which should be developed from secondary school onwards at the European level, drawing on the experiences of the French and Belgian education systems.

Continuing these studies is essential to better understand future skill and recruitment needs. This requires foundational work on data quality and harmonization at the European level through a multi-modal approach.

Regarding nuclear waste management, there is a strong need to develop, for the operators as well as for the safety authority, robust expertise in areas such as safety, security numeric modelling, mining operations and further skills supported by collaborative research efforts. After the nuclear phase out in Germany, much expertise and knowledge has been built up for the site selection process for a HLW repository. There is also a need for skills in social sciences and communication to effectively engage in public dialogue at the highest level.

3.2.2.2. What academic and professional training programs will have to be developed to meet the demand for new jobs and skills?

Two conditions are necessary for current and future workers in the nuclear sector to benefit from genuine training programs: access to information about the most suitable education and training (E&T) programs, and the development of such programs across Europe.

Regarding the first challenge, several tools and platforms already exist and could be further improved. These include the ENEN platform, which centralizes training offers from over 100 European educational partners, with a focus on specialised and targeted qualifications; the I2EN platform, which references French programs at the bachelor's and master's levels with the I2EN seal certifying their quality and that are open to international students.

Access to these tools could be enhanced by integrating them with social media platforms popular among younger generations (such as Instagram and LinkedIn). However, experience shows that word-of-mouth still plays an important role in this area.

Moreover, there is still an unmet need for information about the educational pathways required to pursue specific jobs in the nuclear sector

As for the development or adaptation of new training programs, all experts at the round table agree that the demand will be so great that no single country or institution will be able to address the issue alone. The key will be to establish a coordinated training offer aimed at promoting job mobility across Europe. Promising initiatives already exist, such as: the ENEN mobility program, which provides funding for participation in training courses; French training programs available in English; educational pathways across universities in multiple countries; the development of dual degrees across European Universities; the creation of European-level quality labels to certify qualifications.

It is also important to note and recognize that many jobs (such as project managers, construction workers, electricians, welders) do not require initial specific nuclear education but will need to be “nuclearized” through complementary training programs that must be developed and tailored to specific job-related needs.

3.2.2.3. What propositions and strategies can develop the nuclear sector to attract and retain young and current talents?

The nuclear sector has many strengths to attract the talent it will need in the future, whether from the younger generation or from the existing workforce in other industrial sectors.

To ensure a robust and diverse talent pool in the nuclear sector, it is essential to spark early interest among pupils and students in STEM and later in nuclear science. Introducing young learners, their families, and other influential individuals to the wide range of roles within the field helps them envision a future in the sector. Clear communication about the values of the nuclear industry—such as responsibility and societal contribution—is crucial.

Interesting examples were shared during the session of early career interests sparked by advertisements or TV series that portrayed the nuclear world in a positive light.

The sector should emphasize that it offers meaningful work, from producing clean energy to life-saving medical applications, nuclear material management, and innovations in biotechnology and space technologies. This helps convey the purpose and ethical dimension of careers in nuclear.

Awareness-raising efforts should target both the younger generation and their teachers (“train the trainers”).

Equally important is the care for employees, including recognition, appreciation, collegial work environments, flexible work arrangements and especially the opportunity to stay up to date and retrain in aspects related to the specific job. Offering adequate CPD (continuous development program) is key to retaining talent and fostering a supportive workplace culture.
Another significant advantage for attracting workers from other industrial sectors is the strong reputation of the nuclear industry in safety management.

Support for education and competence development from within the sector itself —ranging from internships and technical visits to contributing to academic and professional training—are vital for attracting new talent and ensuring continuous professional growth. While STEM disciplines are foundational, integrating Social Sciences and Humanities into nuclear education is also essential. This interdisciplinary approach equips engineers and scientists with the additional skills needed to address the sector’s complex challenges.

3.2.2.4. How can knowledge management in the nuclear sector be ensured over very long time periods and what can digital science do in this area?

Nuclear projects span extremely long timeframes—over 100 years—when considering the full lifecycle: design, construction, operation, decommissioning, and waste storage. These timelines stretch across multiple human generations and operate at both national and international scales. This raises a critical question: how can we ensure the transmission of knowledge, expertise, procedural understanding, and sound decision-making over such extended periods?
For systems that rely on storing information in paper-based reports, this represents a true challenge. Digital sciences—and particularly artificial intelligence tools—can be of great assistance, provided a clear strategy is implemented. This strategy should be based on:
The systematic digitization and indexing of all key reports throughout the nuclear project lifecycle.
The use of AI-based tools, trained on this corpus of historical reports.
Supplementing these tools with access to external information sources, such as regulatory websites, standards, codes, and leading scientific journals.
The development and use of such tools should enable training of professional staff; enhanced quality control through lessons learned; ensuring compliance with codes and standards in a highly regulated sector.

Ultimately, these implementations will help establish best practices for the use of digital and AI tools in the nuclear industry.

3.2.3. Take-aways

Proposals for:

Workforce skill requirements in the nuclear sector, and how data can be improved to identify them

- Identify upcoming workforce and skill needs at sectorial, national and European level through harmonized improved and multimodal data collection
- Develop a European approach in workforce planning and enhance information sharing on national gap analyses
- Develop strategies for a built up of competences for the operators as well as for the regulatory bodies.

Academic/professional education and training programs to be developed to meet the demand for new jobs and skills

- Intensify international cooperation in nuclear education and professional training (European dimension programs to foster mobility of workers, harmonization of training and diplomas)
- Support for creation and strengthening of national/regional platforms for education and professional training
- Intensify cooperation between industry, universities, and research institutions

Propositions and strategies to attract and retain young and current talents in the nuclear sector

- Promote nuclear at all levels from early level of education to general population to help novice learners envision a future in this sector
- Promote the advantages and qualities of working in the nuclear sector both at societal and personal level.
- Increase the share of social sciences and humanities in the nuclear education curriculum

Knowledge Management in the nuclear sector over very long time periods: what can do AI in this area?

- Establish industry best practices for deploying AI tools in the nuclear sector (knowledge transfer, staff training, quality control through lessons learned, code compliance assurance)

3.3. Parallel session – Success stories in Research, Development and Innovation in the EU

This parallel session was moderated by **Abderrahim Al-Mazouzi** (SNETP, FR) and **Olli Soppela** (VTT, FI).

The panellists were:

- **Mariano Tarantino**, Head of Nuclear Energy Systems Division, ENEA, IT
- **Petri Kinnunen**, Research and Quality Manager, VTT, FI
- **Héloïse Goutte**, Directrice scientifique énergies, Euratom STC, CEA, FR
- **Alfons Weisenburger**, Group leader, KIT, DE
- **Marta Serrano**, Head of the Materials for Energy Department, CIEMAT, ES
- **Maria Śmietanka**, National Contact Point Department at the National Centre for Research and Development, PL

3.3.1. Scope

Highlight successful collaborative initiatives in nuclear RD&I including the strategic planning, innovations, and resource allocation. Robust funding through the Euratom funding program and public-private partnerships demonstrates that public and private investments can be leveraged and resourcing can be optimized. At the same time, this session also identifies limitations, challenges, and possible solutions with respect to European collaboration in the field of RD&I.

3.3.2. Summary of technical session

After a short introduction of the panellists, the moderators led the discussion with some prepared questions and a lot of interaction with the audience.

The following success stories were highlighted during the discussion:

- Collaborative European projects have strongly supported progress in nuclear reactor safety challenges and new nuclear reactor development, especially with respect to advanced reactors and SMRs.
- Funding from European collaborative projects is a significant part of the total funding available for many institutes/companies. Some of these institutes align their nuclear activities around the European collaborations.
- The 'traditional' type of European collaborative projects (as opposed to the newly introduced partnerships) remain important for many companies.
- Development of dedicated Lead Fast Reactor technology like oxygen sensors, pumps, heat exchangers, decay heat removal systems, and numerical tools for design support and safety analysis.
- Fundamental research is and remains important, e.g. fundamental research has led to more accurate nuclear data which is the basis for all nuclear technology developments.
- Behind every European collaborative project, there is an enormous amount of work, engagement and creativity of the participants.

Suggestions and best practices for European collaborative project coordinators:

- Make very clear who is interested in the results of your project and what is the common goal to improve the impact section in your proposal.
- A long term vision on the topic of your proposal beyond the timeline of the project duration will help in answering the call and in making the objectives realistic and specific.
- Collaboration requires to combine different views and languages. This alignment is an achievement of many European collaborative projects and its significance is often overlooked. To this respect: 'The journey is as important as the destination'.
- Development of reliable data and analytical or numerical tools for explaining current situations and predictions is and remains an important topic.
- Innovation typically takes place for topics or challenges which are not known yet and is often based on a solid and credible fundamental basis. This is why fundamental research should be encouraged.
- The Concerted Action tool is very effective to sort out issues in preparation of collaborating in large platforms.
- National contact points see a lot of projects from all directions and all fields and might be a valuable support when writing new proposals.
- A good researcher is not necessarily a good project manager. Take this into account when selecting a coordinator of your proposal. A good researcher for example may not have legal expertise.
- Involving consultancy companies as project office in your proposal may be necessary if you do not have internal administrative and legal resources and capabilities. Such companies may support writing a proposal and provide input. However, ensure that a proposal still provides sufficient details with respect to the technical content.
- Combine in the projects analytical, numerical (incl. AI, digital twins) and experimental activities.
- Stimulation of cross research activities (within the nuclear field, including fission and fusion, but also in collaboration with non-nuclear fields) are very important drivers for innovation.

The following limitations and challenges were mentioned with respect to European collaborative projects:

- The preparation time (the time between the official release of the call and the deadline for submission of proposals) is extremely short especially if there are holidays in between. Proper proposal preparation will benefit from longer preparation times.

- The administrative burden of collaborative European projects, let alone partnerships, is high. Technical progress and innovation would benefit from less administrative burden.
- Coordinators of collaborative European projects most often have a technical background. Projects which have to deal with legal challenges like IP rights and dual use considerations, would benefit from support by legal experts of the European Commission streamlining solutions for these challenges across the various membership countries.
- Research and developments in the nuclear field (e.g. materials, fuels, thermal hydraulics, nuclear data, …) requires long lead times and may cover decades of work. Continuous support and funding from the European Commission is essential and appreciated.
- New irradiation facilities (both thermal and fast) and additionally fuel cycle demonstration facilities (reprocessing, manufacturing, spent fuel management) will be required.
- Involve young people in the European collaborative projects. Ask for their ideas and allow them to make mistakes. Introduce them in the community, bring them to conferences, and let them participate in collaborations. To this respect, transnational access to experimental infrastructure is important.
- Experimental and modelling uncertainties both need to be addressed.

3.3.3. Take-aways

The following messages are considered the key take-aways can conclusions of the session:

- Collaboration is imperative to accelerate RD&I and European collaborative EU projects are playing a key role (e.g. in advanced reactor progress), but management of and collaboration in such projects brings complexities. Facilitation by the European Commission of the collaborative framework projects could speed up the RD&I processes
    - Concerted Action tool is very effective to sort out (legal) issues when initiating collaboration in large partnerships.
    - More time should be allowed between publication of the call and the deadline for submission
    - It would help if the EC assists in management of the background, foreground, IP rights, and export control. Develop a common European approach/office to deal with this.
    - Project coordinators have to deal with legal challenges like background, foreground, IP rights and dual use considerations. Legal and administrative experts from the European Commission can be supportive in providing a clear and unified framework streamlining solutions for these challenges across the various membership countries.
    - The administrative burden of collaborative European projects, let alone partnerships, is high. Technical progress and innovation would benefit from simplification of the administrative burden.
- Successful research requires large nuclear infrastructure, e.g. thermal as well as fast irradiation facilities and fuel cycle demonstration facilities (manufacturing, reprocessing, spent fuel management).
- The budgets allocated to RD&I of nuclear fission safety should increase if Europe wishes to keep up with developments in Asia and the USA.

4. Plenary session IV " Research and innovation supporting safety, security and safeguards”

Following Plenary Session IV on “**Research and innovation supporting safety, security and safeguards**”, the three parallel technical sessions provided a deeper dive into technical advancements and collaborative projects aimed at maintaining and enhancing safety, security, and safeguards in the nuclear sector. Discussions covered ongoing European R&D initiatives, innovative approaches, and new priorities to ensure safe and secure nuclear technologies.

4.1. Parallel session – Pioneering investment and financial models towards innovation and demonstration

This parallel session was moderated by **Michal Tratkowski**, (EC DG RTD), and **Ana Gonzalez Felgueroso**, (ENS-YGN).

The panellists were:

- **Wojciech Wrochna**, Secretary of State, Plenipotentiary for Strategic Energy Infrastructure, Ministry of Industry, PL
- **Michel Berthelemy**, Senior Strategic Policy Advisor, OECD/NEA
- **Ximena Vasquez-Maignan**, White Case, ES
- **Andrei Goicea**, Policy Director, nucleareurope, BE
- **Kornelia Kwapisz**, WiN Polska, PL

4.1.1. Scope

This session explores mitigating risks and securing diverse financing towards innovation and demonstration of nuclear projects. Addressing these aspects, strengthened by international collaborations in nuclear research, innovation, and demonstration improves the chances of project success and long-term sustainability.

4.1.2. Summary of technical session

4.1.2.1. Wojciech Wrochna, Ministry of Industry, PL

On its path to energy transition, Poland has traditionally focused on renewables, without fully addressing the transition’s impact on industry. Now, nuclear is seen as essential for decarbonisation and long-term competitiveness. However, without a serious discussion on financing—including the role of private capital—technical debates alone will not ensure success. Poland lacks existing nuclear power plants (with one research reactor operational), and is in progress of development of regulatory experience and supply chain, with greenfield development more complex and engagement with investors more difficult than in regions with existing NPPs. With nuclear still excluded from many EU funds, Poland has little choice but to start its project by relying on public financing, as shown by the €15 billion state capital injection for three AP1000 reactors, financed with 30% equity. While Regulated Asset Base models could offer promise, nuclear’ s baseload economics still clashes with current market structures favouring renewables with zero marginal costs. Private investment may be expected later, but only if Poland can demonstrate timely and cost-effective delivery of large NPP and/or several SMRs, with state support essential in the early stages. Efforts are now also focused on making nuclear eligible for EU funds and securing tangible support in the coming months.

4.1.2.2. Michel Barthelemy, OECD/NEA

The current approach to nuclear financing stems from decades of belief in deregulation and divestment, which are now recognized as insufficient for supporting long-term, capital-intensive projects like nuclear. The flawed assumption that electricity is a commodity, while not taking into account its specific traits, like e.g. the fact that it is not storable, led to frameworks that undervalue the unique benefits of nuclear, such as emissions reduction and energy security— which should naturally create a clear rationale for government intervention. The NEA has observed this evolving landscape and highlights in its report, highlighting that financing is fundamentally about managing risk, particularly during the construction phase where state support is most critical.

As projects progress from first-of-a-kind (FOAK) to fleet deployment, risk profiles change and private financing can play a greater role, though not without public support in early stages of development campaign. Models like Regulated Asset Base (RAB) are of particular interest, but must be adapted to each national context rather than copied wholesale. Financing strategies must also remain flexible throughout a project's life, as structural issues of the plant may emerge and require investments. Overall, sustainable financing requires a balance of risk-sharing between the public and private sectors, with a more comprehensive, dynamic framework that reflects the realities of nuclear development.

4.1.2.3. Ximena Vazquez-Maignan, White Case, ES

Commercial banks start growing interest in financing nuclear projects, but funding lower-risk segments like the supply chain is more encouraging than sectors like fuel cycle or full plant development, showing higher risks. The pattern of "chicken-and-egg" is visible: banks want to see active, progressing projects before committing funds, yet such projects can't proceed without financing.

SMRs, including micro-reactors, may simplify deployment but they still share many financial and regulatory risks with large NPPs. On-grid projects can use existing legal and financial frameworks, but novel, off-grid developments need new approaches, while credit-worthiness varies greatly between clients like Microsoft and Google vs. lesser-known entities.

Crucially, banks and the nuclear sector must bridge their knowledge gaps: some of traditional financing tools like step-in rights (change of the operator of the installation in case the project is not well managed) are incompatible with nuclear. Project structure becomes critical—clarity on the responsible borrowing entity is essential, particularly given the nuclear operator's unique obligations. Ultimately, financing mechanisms must be tailored to reflect the specific risks, user demands, and operational context of each nuclear project.

4.1.2.4. Andrei Goicea, nucleareurope, BE

According to various scenarios, Europe needs to expand nuclear capacity from 100 GWe to 150 GWe by 2050, requiring a significant newbuild campaign involving both large reactors and SMRs. Achieving this goal demands sustained innovation, research, and effective financing strategies. The EU SMR Alliance has formed dedicated groups to address financing challenges and assess the current deployment landscape for SMRs, with drafting teams formulating appropriate analyses.

Various public funding mechanisms—such as Horizon Europe, the Net Zero Industry Act, the European Innovation Council, and recently also the IPCEI—create opportunities to support research and help technologies progress, with IPCEI particularly aimed at bringing products to the demonstration stage. These opportunities play a key role in de-risking investments and encouraging private capital participation, creating a more robust environment for nuclear innovation and deployment across Europe.

4.1.2.5. Kornelia Kwapisz, WiN Polska, PL

No nuclear project operates in vacuum — its financing framework depends heavily on credibility and trust, which can be strengthened through strong stakeholder engagement and relations with investors, the supply chain, government, and policymakers. While technical quality and safety are vital, investors also evaluate societal engagement, a key yet often underestimated factor. In Poland, a single BWRX SMR unit could generate 200 GWh monthly, with delays potentially costing €29 million per month in lost revenue. Though some view SMRs as unproven, the BWRX-300 is GEH's 10th-generation design and offers emission reductions, grid stability, and significant employment—2,700 jobs during construction and 700 during operation. Projects that build credibility across multiple dimensions are more likely to secure favourable financing conditions.

4.1.3. Take-aways

The discussion resulting from the interventions included many questions from the public and comments from the panellists. A summary of these exchanges can be formulated into following take-aways:

1. Nuclear projects offer stable, long-term value with high capacity factors, inflation-hedging potential, and are strong economic multipliers through jobs and industrial engagement.

2. Successful financing hinges on trust, stakeholder engagement, and the inclusion of non-monetary benefits like low-carbon energy and energy security.

3. For newcomer countries like Poland, pursuing multiple nuclear technologies in parallel is not feasible—early, clear technology decisions are crucial for licensing and project delivery.

4. Levelized Cost of Electricity (LCOE) does not reflect full system costs—backup needs, grid integration, and dispatchability must be considered to assess the true value of nuclear.

5. First-of-a-Kind (FOAK) projects carry high perceived risks for investors. Managing these requires coordinated government support, particular attention to workforce training and management, and stable supply chains.

6. The broader energy mix and state of infrastructure influence nuclear economics—co-generation, grid stability, and flexible operation should be part of project planning for the general energy system and all its elements.

7. Attention to return on Investment (RoI), capacity factors, and comprehensive cost metrics (beyond LCOE) are critical in making nuclear projects attractive to financiers.

8. Clearer messaging is needed to convey nuclear' s benefits, like low-carbon nature, support to industry with heat and off-grid electricity, and role in Europe's energy resilience.

9. Defining the "operator" under international conventions is vital for SMR deployment—nuclear liability may extend beyond the licensee to the parent company.

10. Energy-intensive industries, large tech firms, and cross-sector alliances are increasingly interested in nuclear, especially SMRs, but need clearer financing pathways and risk-sharing mechanisms.

4.2. Parallel session – Innovation beyond technology and high-tech cross-sectoral applications

This parallel session was moderated by **Christophe Schneidesch** (Tractebel, BE) and **Krislin Sartakov** (ENS-YGN, EE)

The panellists were:

- **Arne Larsson**, Radioactive Waste Technology and Decommissioning Services, Cyclife Sweden (EDF Group), SE
- **Hamid Aït Abderrahim**, General Manager, MYRRHA, BE
- **Christoph Hoeschen**, Chair Medical Systems Technology, Chair MEENAS, DE
- **Tobi Menzies**, Secretary, NEMO, UK
- **Michael Huebel**, Director-General, Euratom Supply Agency, ESA, LU
- **Jamila Mansouri**, Head of Propulsion, Aerothermodynamics and Flight Vehicles Engineering Division, ESA, FR

4.2.1. Scope

The panel focused on innovations spanning both nuclear and non-nuclear high-tech sectors, including waste processing, aerospace, space exploration, maritime, particle accelerators and medical applications. Historically, nuclear technology has been a major innovation driver, but now advancements from other industries are increasingly benefiting the nuclear sector. These cross-sectoral innovations improve efficiency, safety, public perception, and overall effectiveness, addressing key challenges and supporting nuclear energy's role in a sustainable energy future. Cross-industry applications position nuclear energy as a leading solution for clean energy transitions and global competitiveness.

4.2.2. Summary of technical session

During the technical session, panellists delivered brief presentations on cross-sectoral innovations, emphasizing the crucial role of nuclear energy in a sustainable future and how non-nuclear advancements can support the sector.

The discussion covered several topics:

- **Interdisciplinary collaborations and breakthroughs** anticipated in the coming decades, highlighting areas where different fields intersect to drive innovative advancements.
- **Modularity and sustainability** in new nuclear applications, with Tobi Menzies and Jamila Mansouri discussing the impact of recent advancements on floating nuclear power plants and space propulsion systems. They also identified countries leading in these technological developments.

- **Nuclear waste and materials management**, with Arne Larsson and Christoph Hoeschen addressing lessons that could be applied to other industries facing long-term environmental challenges and highlighting cross-sectoral innovations in medical nuclear technologies that could improve public health.
- **Security of supply for nuclear materials and services**, with Hamid Ait Abderrahim and Michael Huebel offering recommendations and exploring strategies to safeguard these resources. They also considered how these approaches could benefit other sectors with similar supply chain challenges.

The session concluded with audience questions, both in-person and via app.

Interdisciplinary collaborations and breakthroughs anticipated in the coming decades – Key messages and recommendations

- Circularity/net zero/sustainability are key objectives for all sectors
- Engagement with society and clear regulations are considered a pre-requisite for innovation
- Interdisciplinary collaboration will push innovation. Sharing results and best practices among different sectors could bring significant benefits
- Same issues exist in different sectors when approaching innovative technologies (i.e. issue on data security, quality and reliability for AI) and they should be solved strengthening collaboration

Modularity and sustainability in new nuclear applications - Key messages and recommendations

- Russia and US are leading the way, but EU need to push to be competitive
- Modularity, flexibility during operation, compatibility and even automated assembly (for space application) are needed as well as micro power reactors
- Focus on fast decommissioning or multiple purposes power reactors to promote sustainable and circular economy approaches

Nuclear waste and materials management in energy and medical field - Key messages and recommendations

- Lessons learned: focus on design phase to be more circular in the future, identify clear responsibilities during the full life cycle, implement mechanism to avoid future generation of waste
- Different countries' regulations translate in different practices preventing circularity and even innovation (i.e. in medical radioisotopes management)

Supply of nuclear materials and services across different sectors - Key messages and recommendations

- Implement a sort of bank at EU level for specific isotopes (when small quantities are needed) and secure materials for research in space applications
- Guarantee capability of enriching Uranium at EU level
- Foster reprocessing to get valuable materials
- Holistic view on the use of materials in different sectors (what is a waste for one sector could be a value for another)

Security of supply to utilities based on diversification of supply sources, long-term contracts, risk-assessment and supply needs.

Questions from the audience and from the app:

- **(*to Jamila Mansouri*) _ Is nuclear the only solution for long-range space missions?**

- There is a pressing need for innovative solutions, including nuclear technologies, to provide fast and efficient options for long-range space missions. Current technologies face significant time limitations due to the extended duration of these missions.

- **(*to all*) _ How open international collaboration (outside EU) can foster innovation?**

There are good examples of well-established international collaborations in both space and medical applications. However, a major challenge arises when transitioning from lab-scale projects to industrial products, particularly in the EU where intellectual property (IP) can sometimes act as a barrier. The medical sector demonstrates good practices with strong industry collaboration to overcome these challenges.

- **(*to all*) _ Considering the EU effort in Defense, can it be considered an opportunity for nuclear and an additional potential cross-sector for collaboration?**

Existing practices in sectors such as commercial/maritime and US-funded radiation medicine offer potential for cross-sector collaboration in defense. However, there is scepticism about the possibility that research results could be used for non-peaceful applications.

4.2.2.1. Arne Larsson, Cyclelife Sweden (EDF group), SE – Waste and decommissioning solutions

The panellist presented Cyclife at a glance and how it has been providing waste treatment and decommissioning services to national and international customers for 40 years. He highlighted how the radioactive waste treatment technologies (in particular metal melting) can lead to the minimization of radioactive waste in line with the circular economy and sustainable practices.

4.2.2.2. Hamid Ait Abderrahim, MYRRHA, BE – Security of supply and sustainability of fuel cycle

The panellist discussed the benefits of fuel recycling and a holistic approach for a sustainable future, highlighting various past and ongoing research projects. They provided several recommendations for industrialisation, including: promoting international cooperation on cross-cutting topics; upgrading existing lab-scale facilities; scaling up MA-loaded fuel fabrication facilities; building demonstrators; developing pilot reprocessing for irradiated advanced fuel; funding projects to explore societal views on a fully closed cycle; assessing the role of pre-industrial demonstration; encouraging projects focused on advanced fuel logistics.

4.2.2.3. Christoph Hoeschen, MEENAS, DE – Research vision for Chair of Medical System Technology – dedicated to collaborative innovation

The panellist emphasized the importance of a strong scientific foundation to drive innovation. They showcased various projects cantered on research and innovation in medical radiation protection. Notably, they introduced the MEENAS consortium of European Radiation Research Platforms, which aims to enhance the integration and efficiency of European R&D in radiation protection. The consortium's objectives include advancing scientific excellence and developing and implementing a joint R&D roadmap.

4.2.2.4. Tobi Menzies, NEMO, UK – Nuclear Energy Maritime Organisation

The panellist introduced the NEMO international membership organization, which brings together stakeholders involved in all aspects of floating nuclear power and nuclear mobility. He discussed NEMO's mission to assist national and international regulators in creating future-oriented standards and rules for the deployment, operation, and decommissioning of floating nuclear power. Finally, he introduced the three working groups within NEMO: (i) Maritime Regulations, (ii) Nuclear Safety, Security and Safeguards, and (iii) Maritime Nuclear Liability.

4.2.2.5. Michael Huebel, Euratom Supply Agency (ESA), LU

The panellist introduced the roles and responsibilities of the ESA, emphasizing the importance of the ESA's Annual Report. This report offers a comprehensive overview of the security of supply across the EU. It includes detailed findings and recommendations on various critical areas such as the supply and demand of nuclear fuels, diversification policies, security of supply, and the security of medical radioisotopes. Additionally, the report outlines the ESA's work programme, providing valuable insights into their ongoing and future initiatives.

4.2.2.6. Jamila Mansouri, The European Space Agency (ESA), FR

The panellist discussed bridging the gap between space and the nuclear world, emphasising that significant work remains to be done to send nuclear components into space. She highlighted that propulsion is a critical topic for new missions, as solar power alone is insufficient, necessitating alternative energy sources. The panellist identified nuclear electric propulsion, nuclear thermal propulsion, and nuclear technologies for space habitats as key enabling and emerging technologies for human spaceflight and exploration.

4.2.3. Take-aways

The present situation is marked by significant technological integration and innovation across sectors. The future presents both challenges and opportunities, with panellists advocating for interdisciplinary collaborations and sustainable practices. The Euratom Research and Training Programme remains a key component in advancing these efforts and ensuring the continued progress and safety of nuclear technologies.

4.3. Parallel session – European research infrastructures, Open-access and International Cooperation

This parallel session was moderated by **Roger Garbil** (EC DG RTD) and **Anna Talarowska** (ENS-YGN).
The panellists were:

- **Tatiana Ivanova**, Head of Division of Nuclear Science and Education, OECD/NEA
- **Nikitas Diomidis**, Adviser & Deputy Head R&D, NAGRA, CH
- **Elizabeth Ainsbury**, Professor, Head of Radiation Effects Department and Head of Radiation Dosimetry Department, UKHSA, UK
- **Sander De Groot**, Founder and Technical lead, THORIZON, NL

- **Alice Seibert**, Principal Administrator, Nuclear Safety & Security, EC JRC, DE
- **Roman Romanowski**, Vice President, New Plant Development, Westinghouse, PL

4.3.1. Scope

Supporting access to key pan-European research infrastructures and promoting international cooperation are critical for advancing nuclear research and development. By fostering strategic partnerships, promoting mobility and exchange, and supporting joint infrastructure initiatives, the nuclear sector can enhance its research capabilities, drive and accelerate innovation for the EU market.

4.3.2. Summary of technical session

4.3.2.1. Setting the Scene – Vision and Strategy

First Nikitas Diomidis (NAGRA, CH) highlighted the most impactful infrastructures to be underground facilities for NW issues. The number of these kind of facilities is still surprisingly small by taking into account how much there is waste to be disposed. The main benefit of these facilities is that they provide realistic conditions and large variety of information.

The key challenges in ensuring the success of these projects was mentioned to be the resources and availability of knowledge. The projects last long and it sets its requirements to keep resources available. Also, the local acceptance is very important. The priorities for the work in these kind of facilities tend to change during decades which requires the facilities to be adaptable. Nagra aims at to define and prioritise open-access infrastructures and international co-operation on their roadmaps.

Tatiana Ivanova (OECD/NEA) highlighted OECD/NEA joint project mechanisms as the joint projects bring together OECD members, non-members, regulators and academia. It involves experimental infrastructures and supports the development of them. The role of the NEA's Second Framework for Irradiation Experiments (FIDES-II) in enhancing experimental support for the development and deployment of fuel and materials was described to be an influential tool with 14 member countries + EU and 29 signatories. FIDES is not only an experimental platform but supports also design, analysis and modelling. The third term for 2027-2032 is currently in planning. NEA Nuclear Education, Skills and Technology (NEST) framework was launched in 2019.

Alice Seibert (EC JRC) described the JRC's processes in ensuring equitable and impactful access to European research facilities by contributing to the transnational projects and collaborating with e.g., RTD as well as granting mobility grants. For example, their own OASIS project allows access to three sites. Having a fair access is solved by arranging calls and with a proper evaluation of the proposals. The visits for scientist are flexible and they can stay either short term (few days) or long term (even a year). Students are favoured to join.

4.3.2.2. Innovation & Infrastructure Access

Elizabeth Ainsbury (UKHSA) told open access to radiation effects infrastructure to improve collaborative outcomes in health and safety related nuclear research by increasing visibility and speeding up the findings.

All projects are going to be shared openly so dissemination is effective. Also, there is a database for infrastructure that helps in understanding the specific infrastructure features and utilizing them.

Sander De Groot (THORIZON) described the main barriers for SMEs and small companies to access major European research infrastructures to be long and complicated testing sequences and the lack of vast spectrum available at the moment. Also, the supportive countries need to be found for economical feasibility. The schedule for all this is extremely slow and small companies cannot wait that long as they need to act fast.

As an improvement he told that the EU and Member States should financially support more nuclear fission and that way also infrastructure utilisation. The nuclear sector has succeeded to stay alive but the centralised coordination is missing. The fission community should actively ask more funds. Also, the fragmentation should be smaller; now everything is divided into too small parts. The whole community could benefit of these improvements.

Mr Romanowski (Westinghouse) added that increased industry-academia collaborative actions would increase the impact of the research and that should be supported. EU and member states should put more emphasis on open access infrastructures still.

4.3.2.3. Funding, Coordination, and Impact

Nikitas Diomidis (NAGRA) mentioned the cooperation across borders to improve efficiency in the long-term waste R&D as many programmes have common goals; it is easy to share expertise and knowledge. But the most important part is the differences (e.g., societal aspects, boundaries), which leads each player to create its own capabilities. This takes too much capacity and should be changed. In general, the main added value of the European collaboration is that the larger community will benefit of the invested funding.

Elizabeth Ainsbury (UKHSA), explained that in UK the seed funding has been used to get players together. In overall the panellist concluded that co-operation needs to be increased and improved and joint challenges bring up the joint strategies and guides funding also to correct places. Westinghouse has increased its presence in Poland very effectively and they find internships usable in European collaboration. Tatiana Ivanova explained how the joint projects maximise the impact the best. In addition, several co-operative actions like in the OFFERR project is very useful but needs to be improved.

4.3.2.4. Knowledge Transfer and Future Outlook

Finally, the panellist discussed also how can exchange programmes and mobility schemes like ENEN2Plus, OFFERR complemented by European Partnerships (EURAD, PIANOFORTE, CONNECT-NM, EUROFusion) be better integrated into project pipelines to support Next-Gen nuclear professionals. These transnational access programmes support access costs and allow a variable geometry approach, both in terms of staff, funding and allow external members participation.

Tatiana Ivanova and Alice Seibert stated the role of multilateral platforms (e.g., IAEA/ICERR, OECD-NEA/FIDES and NEST, EC/ESFRI) in facilitating hands-on training and knowledge sharing to be very important and the feedback on the hands-on experiences is positive and may help young people in their career planning effectively. However, some issues with international researchers exist especially concerning IPR topics and they would need to be solved.

Finally, the biggest missed opportunity (if open-access and cooperation models are not fully implemented into powerful instruments fostering real science diplomacy instruments to tackle today's societal challenges) would be the loss of huge amount of valuable data that has been collected and is available. Databases require active use and they are offered for use quite easily. E.g., OECD databases are at member states disposal rather flexibly and the openness is of high value. The data should be pointed also to the new generation, but it needs to be in such a form and quality that it would be used.

Better coordination for all these aspects is needed and at the same time lots of different disciplines are needed. The panellists believe that there is work for all talented people in the nuclear field no matter if they have nuclear experience or not.

4.3.3. Take-aways

The session underscored the strategic importance of strengthening European and international cooperation to accelerate innovation and maintain scientific leadership in the nuclear sector. Open and equitable access to research infrastructures was recognised as a key enabler of impactful, collaborative R&D. Participants highlighted that ensuring access requires transparent governance, fair evaluation processes, and targeted support for students, SMEs, and early-career researchers.

Funding and coordination emerged as critical challenges. Fragmentation and slow administrative procedures hinder progress, especially for smaller players. Increased investment and improved coordination—both at EU and Member State levels—are essential to enhance infrastructure use and unlock greater societal impact. Joint initiatives such as FIDES-II, OFFERR, and ENEN2Plus were cited as successful examples that should be expanded and better integrated into long-term strategies.

The discussion also emphasised the need for stronger ties between research and industry, including more joint projects and mobility schemes, to build a future-ready workforce. Existing data and research outputs—often the product of decades of work—must be better managed, shared, and tailored to meet the needs of the next generation of nuclear professionals. Hands-on experiences, international exchanges, and training via multilateral platforms (e.g., IAEA/ICERR, OECD-NEA/NEST) play a vital role in this effort.

Ultimately, without robust and accessible research infrastructures and a clear commitment to collaboration, Europe risks missing out on major innovation opportunities and the effective use of valuable data. A more unified and inclusive approach will be key to ensuring that research infrastructures support not only scientific excellence, but also broader societal and policy goals.

5. Conclusion

Over the course of five days, FISA-EURADWASTE 2025 & SNETP Forum provided a unique platform to discuss how nuclear energy can help tackle Europe’s major challenges, from accelerating the green transition to reinforcing industrial and technological leadership. The active engagement and high-quality contributions of all participants demonstrated the strength and momentum of the European nuclear research and innovation community.

We would like to warmly thank all the rapporteurs for their valuable contributions and their commitment in summarising the key outcomes of the technical sessions held during the FISA-EURADWASTE 2025 & SNETP Forum 2025 in May in Warsaw: Olli Soppela (VTT), Ivan Horvatovic (SCK CEN), Pavel Kral (UJV Rez), Guillaume Tremblay (Westinghouse), Albannie Cagnac (EDF), Stéphanie Cornet (CEA), Alexis Geisler-Roblin (NTW), Laurent Billet (EDF), Ferry Roelofs (NRG Pallas), Jadwiga Najder (ENS), Federica Pancotti (Sogin) and Petri Kinnunen (VTT).

We also wish to express our gratitude to all participants whose active engagement and thoughtful questions greatly enriched the discussions. A selection of these questions is available in annex 1 for further reference. We look forward to your continued participation and hope to welcome you at the next edition of the SNETP Forum, where we shall further strengthen the dialogue and cooperation across the European nuclear research and innovation community.

Annex 1 – SNETP response to selected questions

1. Will it be possible to sustain the important open access framework to JRC research infrastructures while facing the substantial financial cuts?

Since the launch of the JRC's open access initiative in 2017, access to its research infrastructures has become a cornerstone of collaborative European nuclear research. It has enabled universities, research organisations, and industry to benefit from state-of-the-art facilities, fostering cross-border excellence and innovation. While financial constraints pose real challenges, the framework can be preserved through co-funding mechanisms, and greater alignment with EU missions and industrial needs. Enhancing synergies with other programmes (e.g., Horizon Europe clusters) could also help sustain access. Ultimately, ensuring continuity will require a coordinated effort among Member States, the Commission, and the research community to underscore the strategic value of these infrastructures in the broader EU R&I ecosystem.

2. How do private investments affect the open-access of the ongoing R&D in the nuclear sector?

Private investments are increasingly vital to advancing nuclear R&D. However, they can also introduce proprietary constraints. Balancing open-access principles with the protection of intellectual property is essential. Public-private partnerships and clear access policies can ensure that critical infrastructure and results remain available to the broader research community, while still incentivizing private innovation. A well-governed framework can turn this into a virtuous circle, where open access and private interests are mutually reinforcing.

3. What are your thoughts regarding the need, and feasibility, of a common research reactor infrastructure with multiple coolants?

The idea of a shared European research reactor capable of supporting multiple coolants is certainly worth exploring, given the growing interest in diverse advanced reactor concepts. Such an infrastructure could potentially provide a unique platform for prototypical irradiation testing and materials qualification under relevant conditions. However, the technical complexity, high investment costs, and governance challenges are significant. Lessons can be drawn from international experiences—such as Russia's MBIR project or the now-discontinued VTR project in the US - to better understand the prerequisites for success. A careful feasibility assessment at the European level, involving Member States and key stakeholders, would be a necessary first step before considering any coordinated initiative of this nature.

4. How do you view the further development of capabilities for security and safeguards in nuclear education and training in Europe?

Security and safeguards have traditionally received less attention than safety in nuclear education. Yet with the geopolitical context evolving and the nuclear revival underway, these areas must be strengthened. Dedicated training programmes, EU-wide certifications, and closer cooperation with the IAEA and Euratom safeguards bodies are needed. Embedding these themes into broader curricula and offering hands-on *learning opportunities through research infrastructures would help build a new generation of nuclear professionals well-versed in all three "S" pillars: safety, security, and safeguards.*

5. What is needed in the European R&D landscape to keep up with Asia and the US?

To remain competitive, Europe must consolidate its R&D efforts and increase strategic investment in key enabling technologies for nuclear innovation. Strengthening cross-border collaboration, streamlining access to infrastructures, and accelerating technology readiness through pilot projects are critical. Beyond funding, agility in decision-making and fostering public-private partnerships will be decisive. Europe should also leverage its regulatory expertise, systems engineering capabilities, and leadership in safety and sustainability to carve out a unique competitive edge globally.

6. How can the nuclear sector benefit from broader EU research and infrastructure funding beyond Euratom?

While the Euratom budget remains limited, nuclear research can - and must - tap into broader EU funding streams. Synergies exist with Horizon Europe, the Digital Europe Programme, structural funds, and even defence and space initiatives. For example, innovations in materials, robotics, or AI have cross-sectoral relevance and can be jointly developed. To do so, the nuclear community needs to better frame its contributions to European priorities like climate neutrality, strategic autonomy, and technological leadership. Interdisciplinary proposals and cross-sector partnerships are key to accessing these multibillion-euro opportunities.

7. What are proposed tools to incentivize private investors to finance SMR deployment, especially at early stages (siting, licensing)?

At early stages of SMR deployment, the risk profile is particularly high, making it challenging to attract private capital. De-risking mechanisms are therefore essential. These can include public co-investment, first-of-a-kind (FOAK) support schemes, state-backed guarantees, and streamlined licensing frameworks. Contract-for-difference models or regulated asset base (RAB) mechanisms are also being explored in several EU Member States. Moreover, aligning SMR deployment with broader policy goals -such as industrial decarbonisation, or regional development - can open up access to other funding streams and strengthen the investment case for private actors.

8. ESA is starting to look at nuclear propulsion. How long might it take until a European space reactor project is launched?

Interest in nuclear propulsion and power systems for space is growing, with ESA and national space agencies beginning to assess options. However, developing a European space reactor would require significant technological, regulatory, and political groundwork. Realistically, we are likely a decade or more away from the actual launch of a dedicated reactor development programme. Near-term priorities include feasibility studies, international coordination, and establishing a regulatory framework. Early collaboration with industry and research institutions—leveraging European nuclear and aerospace expertise—will be essential to accelerate readiness while ensuring safety and compliance.

9. Given large efforts to reinforce the EU defence industry, could it benefit the nuclear sector?

The renewed push to strengthen the EU's defence industrial base—driven by geopolitical tensions and the need for strategic autonomy—could create indirect but significant benefits for the civil nuclear sector. Both sectors share technological overlaps in areas such as radiation-hardened materials, advanced simulation and modelling, control and instrumentation systems, supply chain resilience, and high-assurance engineering.

Investments in European capacity for manufacturing, skilled labour, and R&D—if structured inclusively—could also support the nuclear sector's industrial revival. Shared infrastructure, talent pipelines, and innovation programmes (e.g., in AI, cybersecurity, or additive manufacturing) are areas where both sectors can benefit from convergence.

However, to ensure positive spill overs, coordination mechanisms are needed between EU defence instruments (e.g., the European Defence Fund) and civil research frameworks like Horizon Europe and Euratom. Establishing a structured dialogue between defence, space, and energy actors—while respecting the legal boundaries around the peaceful use of nuclear energy—could unlock new opportunities for technological cross-fertilisation and industrial resilience.

10. What are the main barriers to deploying nuclear propulsion in space, and how can regulatory and political hurdles be balanced with strategic advantages?

The main barriers include the absence of a clear regulatory framework at both European and international levels, public perception issues, and technological maturity. Political hesitation often stems from associations with weaponization or risk, even though space nuclear propulsion is distinctly peaceful and strategic. To move forward, Europe needs an open debate combining scientific evidence, safety assurance, and geopolitical considerations. Establishing an EU position, along with a phased roadmap - starting with non-propulsive applications like surface power - could help build public and political confidence while retaining strategic momentum.

11. Is nuclear not a mandatory part of the solution for sustained space missions, especially as an energy source rather than for propulsion?

Indeed, for long-duration and deep-space missions, nuclear energy is increasingly recognised as a necessary solution - not just for propulsion but also for reliable power generation. Solar energy has limitations in distant or shadowed environments (e.g., Moon poles, Mars winters), making nuclear-based power sources such as radioisotope thermoelectric generators (RTGs) or fission surface power systems essential. While some space actors may be cautious, the operational logic is clear: without nuclear, certain scientific and strategic missions would be technically unfeasible. The challenge now is to build the capabilities and governance structures to enable its safe and effective use.

Annex 2 – Programme

The programme of parallel technical sessions is presented below. The full Conference programme is available here.

Tuesday 13 May

14:00 - 15:30	**Plenary session I (WH1): "Achieving Net Zero by 2050 in Europe"** Nuclear contribution to achieve the decarbonisation of the European Economy in an efficient and responsible way. The landscape of the European and global nuclear market is complex and multifaceted, influenced by a mix of political, economic, environmental, and technological factors. **Panelists:** **Ladislav Havlicek**, Director, Ministry of Industry and Trade, CZ **Ilkka Poikolainen**, President and CEO, Posiva, FI **Brianna Lazerwitz**, Energy Economist, Section Planning and Economic Studies, IAEA **Olivier Dubois**, Commissaire ASNR, FR **Rafał Kasprów**, Chief Executive Officer – ORLEN Synthos Green Energy sp. z o. o, OSGE, PL **Moderators:** **Paweł Gajda**, Director of Nuclear Energy Department, Ministry of Industry, PL **Youssef Fargani**, French YGN, SFEN JG **Rapporteur:** **Said Abousahl**, Expert, FR
	Three parallel technical sessions **Parallel I.1 (WH2) "Preserving safely the European assets, pioneering advances for safe horizons"**
	Innovative Long-Term Operation approaches for facilities, radioactive waste pre-disposal and long-term storage solutions and radiation protection enhancements. **Panelists:** **Jean-Christophe Huchard**, Directeur Production Amont, EDF, FR **Bram-Paul Jobse**, CFO, EPZ, NL **Markéta Dohnálková**, SÚRAO, Chair of IGD-TP, CZ **Soufiane Mekki**, RWMC/CDLM, NEA/OECD **Tomasz Bury**, Silesian University of Technology, Faculty of Energy and Environmental Engineering, PL **Christophe Bruggeman**, Deputy Director-General, SCK-CEN, EURADSCIENCE, BE **Moderators:** **Luis Enrique Herranz Puebla**, CIEMAT, ES **Miriam Diaz**, Spanish YGN, Jovenes Nucleares **Rapporteur:** **Olli Soppela**, VTT, FI

16:00 - 18:00	<u>Parallel I.2 (WH1)</u> **"The European Alliance to develop, demonstrate and deploy SMRs by early 2030s"** Small Modular Reactors for the European Market. **Panelists:** **Peter Baeten**, Director-General, SCK-CEN, BE **Olli Kymäläinen**, Technical Director, Fortum, FI **Virginie Wasselin**, Chef du service stratégie filières, ANDRA, FR **Ghislain Pascal**, Policy Officer, DG ENER, EC **Hidde Baars**, Director Government Affairs NL and EU, URENCO, NL **Jan Prasil**, Director, Ministry of Industry and Trade, CZ **Moderators:** **Angelgiorgio Iorizzo**, EC DG RTD **Fabio Nouchy**, Italian YGN, Tractebel BE, INYG **Rapporteur:** **Ivan Horvatovic**, SCK-CEN, BE Presentations ▼ <u>Parallel I.3 (WH3)</u> **"Nuclear new build in Europe"** Lessons learned from the experience of newly built (NPP, research reactors, URL, RWM facilities), delivering on time and budget by continuous improvement in all areas. **Panelists:** **Andrzej Sidło**, Counsellor to the Minister, Ministry of Industry, PL **Lou Martinez**, CTO and Executive Vice President of R&I, Westinghouse, ES **Juha Poikola**, Manager and Public Relations, Teollisuuden Voima Oy, FI **Pascal Charles**, Directeur R&D Production & Ingénierie, EDF, FR **Moderators:** **Baptiste Pothet**, Framatome, FR **Alexandre Havard**, French YGN, SFEN JG **Rapporteur:** **Pavel Kral**, UJV Rez, CZ

Wednesday 14 May

8:30 - 10:00	**Plenary session II (WH1) "Enablers for Innovative nuclear, strengthening the EU strategic competitiveness and autonomy"** Technological, financial and collaborative enablers. **Panelists:** **Thomas Rief**, Director R&D, Woelfel, DE **Ioana Davidescu**, EC DG Competition, BE **Massimiliano Tacconelli**, Director Nuclear and Big Science, Waltertosto, IT **Erika Holt**, Principal Scientist, VTT, FI **Frederik Reitsma**, Section Head, Nuclear Power Technology Development, IAEA **Moderators:** **Marta Vázquez**, EMPRE, ES **Benoit Erbacher**, IYNC **Rapporteur:** **Liisa Heikinheimo**, Expert, FI
	Three parallel technical sessions **Parallel II.1 (WH1) "Innovative nuclear fuel cycles and materials strategies"**
	Innovations in fuel cycle (Accident-Tolerant Fuels, advanced and innovative fuel types, MOX and others, HALEU, multi-recycling, closed fuel cycles), in radioactive waste management (minimisation towards a circular economy) and in materials (high temperature, corrosion resistant). **Panelists:** **Lorenzo Malerba**, Profesor de Investigación Materiales, CIEMAT, ES **Virginie Solans**, NAGRA, CH **Hugues Hinterlang**, Head of EU Public Affairs, Orano Group, FR **Paul Schuurmans**, Scientific Adviser, SCK-CEN, BE **Szavai Szabolcs**, Head of Department, AEMI, HU **Véronique Rebeyrolle**, Fuel BU R&D and IP Senior Manager, Framatome, FR **Moderators:** **Mykola Dzubinsky**, EC DG RTD **Pau Aragon**, Spanish YGN, Jovenes Nucleares **Rapporteur:** **Guillaume Tremblay**, Westinghouse, FR

10:30 - 12:30	<u>Parallel II.2</u> (<u>WH2</u>) **"Artificial intelligence and digital technologies for safe and sustainable nuclear activities "** The application of advanced technologies (e.g. AI and digital twins) can help ensure safe, efficient and sustainable nuclear activities, therefore it is critical for the future of nuclear energy. **Panelists:** - **Istvan-Réka Szöke**, Deputy Director, Head of Applied Physics, IFE, NO - **Jani Halinen**, Head of Nuclear Energy research, VTT, FI - **Patrick Morilhat**, Director of R&D, EDF, FR - **Ander Wik**, R&D Manager for Nuclear and Digitalization, Vattenfall, SE - **Nelly Ngoy Kubelwa**, Division of Nuclear Power, IAEA **Moderators:** - **Eero Vesaoja**, Fortum, FI - **Keziah Garba**, Women in Nuclear YG **Rapporteur:** - **Albannie Cagnac**, EDF, FR <u>Parallel II.3</u> (<u>WH3</u>) **"Solutions to non-electric energy demand including hybrid energy systems"** Cogeneration and simultaneous production of electricity and useful heat (or other forms of energy) improves the overall efficiency of energy use and offers several advantages, such as reducing greenhouse gas emissions, reducing the use of fossil fuels and enhancing energy security. Collaboration with energy intensive end-users. Cross-sectoral industrial cooperation for secure, reliable and affordable energy. **Panelists:** - **Józef Sobolewski**, Director for HTR Development, NCBJ, PL - **Michele Frignani**, Nuclear Technology and Safety, Ansaldo, IT - **Nicola Rega**, Executive Director, Climate Change and Energy, CEFIC, BE - **Slavica Ivanovic**, SMR Innovation Project Lead, Tractebel, ME - **Paul Nevitt**, VP Science and Technology at NNL, UK - **Stéphane Sarrade**, Direction des Programmes Énergies, CEA, FR **Moderators:** - **Michael Fuetterer**, EC JRC - **Alexis Amachree**, Women in Nuclear YG **Rapporteur:** - **Stéphanie Cornet**, CEA, FR

13:30 - 15:00	**Plenary session III (WH1) "Empowering future generations and engaging with civil society"** Sustainability, safety, and societal acceptance of nuclear energy and technology can ensure a well-informed, skilled, and engaged community of professionals and stakeholders in the definition of the energy mix. **Panelists:** **Nadja Zeleznik**, Senior Researcher, EIMV, SI **Francisco Javier Elorza Tenreiro**, President, ENEN **Stefano Monti**, President of ENS, ENS **Philippe Charry**, Member TEN, EESC, FR **Teodora Retegan Vollmer**, Head Nuclear Chemistry and Industrial Materials Recycling, Chalmers, RO **Jana Kalivodova**, Senior Scientist, CVR, CZ **Moderators:** **Seif Ben Hadj Hassine**, EC DG RTD **Lidija Gajinovic**, ENS-YGN **Rapporteur:** **Mariusz Dąbrowski**, NCBJ, PL
	Three parallel technical sessions **Parallel III.1 (WH1) "Addressing social, ethical, and cultural factors towards Sustainable Development Goals"** By addressing social, ethical, and cultural factors, Europe can more effectively transition to a carbon-neutral economy that is inclusive, just and sustainable. Key considerations and strategies must ensure a comprehensive and inclusive approach. **Panelists:** **Florian Rauser**, Vice-President, Federal Office For Radiation Protection, BFS, DE **Alena Mastantuono**, Vice-President of TEN, EESC, CZ **Tanja Perko**, Researcher, SCK CEN, BE **Emilia Janisz**, Consultant Clean Air Task Force, PL **Myrto Tripathi**, President, Voices of Nuclear, FR **Marco Ricotti**, Professor, Dipartimento di Energia, Politecnico Milano, IT **Moderators:** **Jessica Johnson**, Communications & Advocacy Director, nucleareurope UK/BE **Hugo Bernat**, Belgian YGN, BNS-YGN **Rapporteur:** **Alexis Geisler-Roblin**, NTW, FR

15:30 - 17:30	**Parallel III.2 (WH2) "Cooperation to attract and retain skills and competencies and preserve knowledge and expertise"** Addressing the talent gap in the nuclear sector requires a multifaceted approach that includes education, training, reskilling and knowledge transfer, workforce development, international collaboration, mentorship, diversity and inclusion, innovation, public and private engagement. By implementing these strategies, the nuclear industry can attract and empower the next generation of experts, ensuring a sustainable and innovative future. **Panelists:** - **Michèle Coeck**, Director, Nuclear S&T Academy, SCK CEN, BE - **Brian Eriksen**, Team Leader EHRO-N, Euratom Coordination, EC JRC, NL - **Gabriel Pavel**, Executive Director, ENEN, RO - **Nawal Prinja**, Technology Director, Amentum, UK - **Jochen Ahlswede**, Head of Research/International Department, BASE, DE - **Thibaud Reysset**, Project Director, I2EN, FR **Moderators:** - **Alexandru Tatomir**, BGE, DE - **Iñigo Gayo de Leon**, Jovenes Nucleares YG, ES **Rapporteur:** - **Laurent Billet**, EDF, FR **Parallel III.3 (WH3) "Success stories in Research, Development and Innovation in the EU"**
	European Member States, the European Commission and Euratom, European Technology Platforms and Industrial Alliances can create successful stories in nuclear research, development, innovation, and demonstration technologies. This multi-faceted approach will help to achieve technological advancements, enhance safety, and gain public acceptance for nuclear technologies in Europe. **Panelists:** - **Mariano Tarantino**, Head of Nuclear Energy Systems Division, ENEA, IT - **Petri Kinnunen**, Research and Quality Manager, VTT, FI - **Héloïse Goutte**, Directrice scientifique énergies, Euratom STC, CEA, FR - **Alfons Weisenburger**, Group leader, KIT, DE - **Marta Serrano**, Head of the Materials for Energy Department, CIEMAT, ES - **Maria Śmietanka**, National Contact Point Department at the National Centre for Research and Development, PL **Moderators:** - **Abderrahim Al Mazouzi**, SNETP, FR - **Olli Soppela**, VTT, FI **Rapporteur:** - **Ferry Roelofs**, NRG, NL

Thursday 15 May

9:00 - 10:30	**Plenary session IV (WH1) "Research and innovation supporting safety, security and safeguards "** The European and global nuclear markets are characterised by a mix of mature and emerging technologies, diverse regulatory environments, and varying levels of public acceptance. While facing significant challenges, the nuclear industry holds substantial opportunities for contributing to clean energy transitions and meeting future energy demands. Strategic investments, technological innovation, and international collaboration will be key to overcoming obstacles and ensuring safe, secure and sustainable nuclear activities. **Panelists:** **Valéry Detilleux**, Section Head, Bel-V, BE **Ulla Engelmann**, Director Nuclear Safety and Security, EC JRC **Javier Dies Llovera**, Commissioner Nuclear Safety Council, CSN, ES **Fulvio Mascari**, Researcher, ENEA, IT **Akos Horvath**, Director-General Centre for Energy Research, HUN-REN, HU **Jean-Christophe Gariel**, Directeur général adjoint, chargé du Pôle Santé et Environnement, ASNR, FR **Moderators:** **Leon Cizelj**, Jožef Stefan Institute, SI **Alessio Iuvara**, Italian YGN, INYG **Rapporteur:** **Daniela Diaconu**, RATEN ICN, RO
	Three parallel technical sessions **Parallel IV.1 (WH3) "Pioneering investment and financial models towards innovation and demonstration"** Mitigating Risks, Securing Financing towards innovation and demonstration. Addressing these aspects, international collaborations in nuclear research, innovation, and demonstration can effectively mitigate risks, secure necessary financing, and ensure robust project management, thereby enhancing the chances of project success and long-term sustainability. **Panelists:** **Michel Berthelemy**, Senior Strategic Policy Advisor, OECD/NEA **Kornelia Kwapisz**, WiN Polska, PL **Ximena Vasquez-Maignan**, White Case, ES **Wojciech Wrochna**, Secretary of State, Plenipotentiary for Strategic Energy Infrastructure, Ministry of Industry, PL **Andrei Goicea**, Policy Director, nucleareurope, BE **Moderators:** **Michal Tratkowski**, EC DG RTD **Ana Gonzalez Felgueroso**, ENS-YGN **Rapporteur:** **Jadwiga Najder**, European Nuclear Society, PL

	Parallel IV.2 (WH2) "Innovation beyond technology and high-tech cross-sectoral applications"
11:00 - 13:00	Innovations in industrial technology have broad applications across various high-tech sectors like, aerospace, nuclear, space exploration, maritime sector, aviation, and particle accelerators… Innovations beyond nuclear technology that can benefit the nuclear sector often come from non-nuclear industries. These innovations can enhance efficiency, safety, public perception, and overall effectiveness. These cross-industry applications can help address some of the key challenges facing nuclear energy and support its role in a sustainable energy future. **Panelists:** **Arne Larsson**, Radioactive Waste Technology and Decommissioning Services, Cyclelife Sweden (EDF group), SE **Hamid Aït Abderrahim**, General Manager, MYRRHA, BE **Christoph Hoeschen**, Chair Medical Systems Technology, Chair MEENAS, DE **Tobi Menzies**, Secretary, NEMO, UK **Michael Huebel**, Director-General, Euratom Supply Agency, ESA, LU **Jamila Mansouri**, Head of Propulsion, Aerothermodynamics and Flight Vehicles Engineering Division, ESA, FR **Moderators:** **Christophe Schneidesch**, Tractebel, BE **Krislin Sartakov**, ENS-YGN **Rapporteur:** **Federica Pancotti**, Sogin, IT **Parallel IV.3 (WH1) "European research infrastructures, Open-access and International Cooperation"**
	Supporting access to key pan-European research infrastructures and promoting international cooperation are critical for advancing nuclear research and development. By fostering strategic partnerships, promoting mobility and exchange, and supporting joint infrastructure initiatives, the nuclear sector can enhance its research capabilities, drive and accelerate innovation for the EU market. **Panelists:** **Tatiana Ivanova**, Head of Division of Nuclear Science and Education, OECD/NEA **Nikitas Diomidis**, NAGRA, CH **Elizabeth Ainsbury**, Professor, Head of Radiation Effects Department and Head of Radiation Dosimetry Department, UKHSA, UK **Sander De Groot**, Founder and Technical lead, THORIZON, NL **Alice Seibert**, Principal Administrator, Nuclear Safety & Security, EC JRC, DE **Roman Romanowski**, Vice President, New Plant Development, Westinghouse, PL **Moderators:** **Roger Garbil**, EC DG RTD **Anna Talarowska**, ENS-YGN **Rapporteur:** **Petri Kinnunen**, VTT, FI

Annex 3 – Photos


FISA
EURADWASTE
2 0 2 5


FISA
EURADWASTE
2 0 2 5
SNETP


SNETP Forum

More pictures are available on the SNETP website.

ABOUT SNETP

The Sustainable Nuclear Energy Technology Platform (SNETP) was established in September 2007 as a R&D&I platform **to support technological development for enhancing safe and competitive nuclear fission in a climate-neutral and sustainable energy mix.** Since May 2019, SNETP has been operating as an international non-profit association (INPA) under the Belgian law pursuing a networking and scientific goals. It is recognised as a European Technology and Innovation Platform (ETIP) by the European Commission.

The international membership base of the platform includes industrial actors, research and development organisations, academia, technical and safety organisations, SMEs as well as non-governmental bodies.

secretariat@snetp.eu

www.snetp.eu

SNETP

SNE_TP

9 782919 313433