



## ENEF Secretariat's Conclusions

6-7 November 2023, Bratislava, Slovakia

### I. General Overview

The ENEF 2023 reconfirmed the Forum's primary purpose to serve as a unique platform for transparent and inclusive discussion on nuclear matters by welcoming everyone interested in nuclear energy to express openly their voice, views, and opinions.

The two-day Forum held in Bratislava on 6 and 7 November 2023 enabled a broad debate around the potential, opportunities, risks and challenges of the EU nuclear ecosystem, reflecting on both the current Union's climate ambition and the dynamic geopolitical environment.

The event attracted large interest from the EU and abroad. More than 250 representatives of EU Member States, European institutions (European Commission, European Parliament and European Economic and Social Committee), industry, nuclear safety authorities, civil society organisations (CSOs), including those critical towards nuclear energy, and other stakeholders attended the event and took active part in the discussions.

This year's ENEF agenda featured the current topics related to nuclear energy development in the EU. The attendees had an opportunity to exchange on two main topics:

- **Topic 1:** opportunities and challenges of **diversification across the nuclear value chain** in the interest of EU's security of supply and nuclear safety, and
- **Topic 2:** status and remaining challenges for the **back-end of the fuel cycle** (with a dedicated focus on the high-level waste disposal and decommissioning).

The ENEF 2023 programme enabled stakeholders' discussion either in parallel roundtables (so-called **World Café sessions**) or in plenaries. During the first topical session on diversification across the nuclear value chain, the World Café format roundtables further allowed participants to debate four specific sub-topics:

1. nuclear fuel cycle – diversification options and availability of advanced fuels,
2. European nuclear ecosystem – opportunities and challenges in supply chain diversification and standardisation for nuclear components and services, including for small modular reactors (SMRs),
3. European nuclear ecosystem – regulatory framework, competences, staffing and funding risks and needs,

4. global nuclear ecosystem – competitiveness (strategic competition with third countries) and challenges for nuclear during military conflicts (security of energy supply, safety, safeguards, human impact on plant staff).

Reflecting on the fruitful and constructive exchanges during the panel and roundtable discussions, the ENEF Secretariat summarised the debate as follows:

## **II. Session 1: Diversification across the nuclear value chain (opportunities and challenges for the EU’s security of supply and nuclear safety)**

The Forum:

- Took note of the presentation on the ongoing EU nuclear ecosystem study undertaken for the European Commission by an external contractor. The Forum welcomed the discussion held on the preliminary outcomes of the study assessing whether the ecosystem can deliver on the EU decarbonisation targets. The ENEF participants encouraged the contractor to reflect on the discussion and to incorporate key debate takeaways in the final conclusions and recommendations.
- Acknowledged the renewed interest in the nuclear energy options for those Member States that opted to rely on nuclear power as low-carbon energy in their efforts to deliver on the EU climate goals, while also enhancing the security, reliability, and affordability of power supply. The Forum, at the same time, reconfirmed diverging views on the role of nuclear in the medium- and long-term and its potential to be part of the climate and energy solution for the EU.
- Reiterated the importance of the clear political will / commitment needed to give predictable perspective and strong impetus to the nuclear industry to accelerate its efforts in developing and deploying innovative nuclear technologies.
- Identified the following needs and enabling conditions for the future EU nuclear ecosystem to further contribute to improving the EU global competitiveness and strategic autonomy:
  1. secure and diversified **nuclear fuel and component supplies**,
  2. well-established and reliable **nuclear supply chain**, capitalising on the potential for **standardisation of components** to complement the diversification of sources,
  3. enhanced **cooperation among the EU nuclear safety authorities** – the challenge of **getting convergence of safety assessment practices** (necessary to achieve scale effects, in particular for SMRs deployment in the EU), while preserving the continuous safety improvement principle enshrined in the EU regulatory framework,
  4. **sufficient level of skills** and access to **funding** for nuclear projects.

In this context, the Forum:

- Sees the existing uranium market and enrichment capacity as relatively sufficient to meet the current demand and **security of supply**. However, large investments are needed to maintain these capacities in the mid- to long-term. The new advanced reactors (Generation IV) are posing new challenges, in particular, they may require uranium enriched beyond 5% of U-235, so-called low-enriched plus (LEU+) or HALEU (high-assay low-enriched uranium). This will necessitate amendment in facilities’ licences, as well as new

investments and upgrade of the enrichment facilities. As to fuel fabrication, the Forum considered the diversification issues not fully overcome, in particular for the VVER-type fuels. Concerning SMRs, the Forum considered that the fuel for the light-water SMR technology will be mostly based on traditional (existing) fuels, while some of the advanced SMR designs (AMRs) are expected to require HALEU. The EU currently lacks industrial manufacturing capacity in the HALEU domain. Therefore, the Forum called for strong political action to establish the EU HALEU capacity, to also serve medical radioisotope production needs.

- Acknowledged the EU's need to have a **strong nuclear supply chain** based on a coordinated and inclusive approach to localisation across the Member States. This is important for the successful and fast development of nuclear projects. Standardisation might have the potential to facilitate the process, in particular to overcome cost overruns and delays in realisation of nuclear projects. However, the standardisation approach cannot be implemented 'overnight' and needs in-depth analyses driven by the industry and backed by the interested Member States and nuclear safety regulators (in particular in the area of the potential regulatory convergence).
- Commended the work on SMRs done by Member States, nuclear safety regulators, nuclear industry, and the Commission (including in the framework of the EU SMR pre-Partnership) and welcomed Commissioner Simson's announcement of launching the **EU SMRs Industrial Alliance** in the months to come. The ENEF participants called all relevant actors to accelerate and focus their efforts on a limited number of SMR designs closest to their deployment.
- Expressed consensually serious concerns about **the lack of human resources** required in the nuclear field. The significant need for all types of nuclear skills, including for areas such as radioactive waste management, decommissioning, and emergency preparedness and response was pointed out. The issue was identified as challenging not only for the nuclear industry but also for nuclear safety regulators, public authorities (including at governmental level), and research organisations. The ENEF participants suggested concrete ideas to tackle the situation, including through carrying out gap analyses at national level, attracting the young generation's interest from a very early age, adapting schools and university curricula, and ensuring mobility of skilled persons across the EU. In this context, the role of the Commission and forthcoming European SMR Industrial Alliance were also highlighted.
- Called for making **public and private funding** more accessible to nuclear projects and initiatives. The role of the European financial institutions such as the European Investment Bank (EIB) and the European Bank for Reconstruction and Development (EBRD) along with tools like Euratom loans, Environmental, Social and Governance (ESG) instruments in line with the EU taxonomy, as well as instruments foreseen in the Net Zero Industry Act and in the Modernisation Fund were mentioned. Some concerns were expressed about the EU taxonomy limitations and non-inclusion of all nuclear fuel cycle services (for instance of conversion, enrichment, and reprocessing activities).
- Discussed the **impact of military conflicts on the nuclear energy development**, highlighting the importance of the European / international emergency preparedness and response framework and maintaining the highest level of nuclear safety, security, and

radiation protection. The unprovoked Russian military aggression towards Ukraine confirmed the need for the EU to take immediate action to significantly reduce dependency on Russia's (and other unreliable partners') supply of nuclear fuel cycle services and nuclear-related components and materials. Some ENEF participants also proposed the establishment of ambitious diversification and self-sufficiency targets for the EU enrichment and conversion services, with specific deadlines set.

### **III. Session 2: Panel discussion in plenary: Back-end of the fuel cycle**

The Forum:

- Acknowledged the complexity and sensitivity of **all services related to the back-end** of the nuclear fuel cycle with a **dedicated focus on high-level waste disposal and decommissioning**. It reconfirmed that the availability of sustainable and durable solutions in the field is key to having a sustainable and trustworthy nuclear energy sector.
- Recognised that the EU has today one of the most coherent, comprehensive, and enforceable legal frameworks worldwide for nuclear safety. Amongst its pillars, this framework also includes the safe and responsible management of spent fuel and radioactive waste. The Forum reminded that all actors involved in radioactive waste management need to continue working in a way to transform this EU legal framework into practical solutions.
- Pointed out that the **deep geological repository (DGR)** represents the safest and most sustainable option as the end point of the management of high-level waste and spent fuel considered as the waste. Therefore, the Forum welcomed the forthcoming commissioning of the first DGR for spent nuclear fuel and high-level waste disposal in Finland in 2025. The project will be a game-changer and bring a breakthrough in this field. The Forum encouraged Member States and relevant industries to continue collaborating and sharing best practices in terms of planning, commitment of adequate resources, necessary research and training activities, and engagement with the public and other stakeholders to accelerate the implementation of high-level waste disposal in their territory.
- Recognised the complexity of the shared DGR concept. Recommended as a good starting point to enhance the coordination among Member States on research and development activities, particularly on strengthening the harmonisation of the waste classification schemes, as well as waste disposal containers.
- Highlighted the increasing number of **decommissioning projects in the EU** in the next decades. Building on the experience already gained with the decommissioning programme implemented in Slovakia, Bulgaria and Lithuania, Member States are encouraged to share related knowledge and best practices to avoid cost overruns, extensive delays and minimise other risks.
- Reconfirmed the key importance of **public consultation and public engagement** in all stages of the nuclear project development. Gaining public trust and involving / interacting with the concerned local communities at a very early stage is a paramount prerequisite to make progress with siting of waste disposal facilities and advancing decommissioning projects. Openness, transparency and financial resources are necessary conditions for enabling the continued participation of local communities in the decision-making process regarding deep geological disposal.

- Noted again with serious concerns the **issue of nuclear skills** which is becoming more challenging particularly for those Member States which decided to rely on nuclear energy in the mid- to long-term perspective. To respond to the needs and requirements of all nuclear-related actors (such as industry, nuclear safety regulators, research organisations, public and governmental bodies), maintaining a sufficient level of well-educated, trained, and competent staff is of paramount importance.

#### **IV. Next steps**

**The next ENEF edition will be held in Prague, Czechia.** The exact dates and programme will be determined early 2024.