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Keynote: Euratom Research and Training and Horizon Europe framework programmes: Opportunities and challenges in the EU Innovation landscape

10th edition of the European Commission Conferences
on Euratom Research and Training
in Safety of Reactor Systems (FISA 2022) and
Radioactive Waste Management (EURADWASTE ’22)

Ladies and Gentlemen,

[Introduction]

On behalf of Commissioner Mariya Gabriel, I am very happy to join you today at the 10th edition of the FISA-EURADWASTE conferences. It is a great honour to be here among the world's leading experts and stakeholders from industry, academia and policy-making.

I would first like to thank the French CEA, the *Commissariat à l’Energie atomique et aux énergies alternatives* that, together with the European Commission, has organised this important event for the nuclear community, under the scope of the French Presidency of the Council. A special thank you also to the *Région Auvergne-Rhône-Alpes* and his President Laurent Wauquiez who has kindly hosted this event throughout this week. Thank you also to SFEN, the *Société française d’énergie nucléaire* and to SNETP for the good collaboration.

I take this opportunity to pay tribute to ITER Organization Director-General, Dr Bernard Bigot, following his recent passing on 14 of May. I have a profound respect for his achievements, a life at the service of nuclear research and innovation, both fission and fusion. Bernard Bigot was also *Administrateur général* at CEA and former Director of *École Normale Supérieure* here in Lyon.

Ladies and Gentlemen,

We are all conscious of the challenging times we are living. These times require unity, and strong solidary action.

[Euratom R&I support to the energy transition to 2050]

Regarding the energy transition, I would like to underline that Research and Innovation (R&I) has growing relevance to accelerate the diversification of our energy sources and technologies. We need to reduce our dependency in particular from unreliable partners.

This is not only valid from a medium-term perspective but also for the very next future. And the Commission REPowerEU initiative is going in this direction.

The EU should accelerate its path in view of reducing by 55% its greenhouse gas emissions by 2030 and become the first carbon-neutral continent by 2050.

For this purpose, all technologies are needed and it is up to the Member States to choose their energy mix.

Last February, the Commission approved the complementary Delegated Act on the Taxonomy Regulation, which aims to guide private investments to achieve climate neutrality. Nuclear technologies are included in this Delegated Act with some conditions.

Today, half of the Member States[1] have opted either for large-scale nuclear facilities, or future Small Modular Reactors (SMRs). Because they are smaller in size and modular, SMRs promise to be safer, cheaper and easier to build and operate.

As a result, they could bring electricity and heat to regions where economic, geographical or grid-related constraints impede the economic viability of large conventional power plants. In several EU Member States, SMRs may be an option to switch from coal power plants to decarbonized electricity. This was explicitly mentioned in the recent High-level Commissioner Gabriel Nuclear Roundtable.

Innovative SMR designs are expected to display enhanced safety performance through passive and inherent safety features.

The Euratom Research and Training programme has been funding several activities on nuclear safety, advanced materials and licensing for new types of reactors, including SMRs.[2]

[1] Currently, 13 Member States have operational nuclear power plants (Belgium, Bulgaria, Czech Republic, Finland, France, Germany, Hungary, the Netherlands, Romania, Slovakia, Slovenia, Spain and Sweden) of which 3 plan nuclear phase-outs by 2030 (Belgium, Germany, Spain). 8 Member States are building or planning new reactors (Bulgaria, Czechia, Finland, France, Hungary, Poland, Romania and Slovakia). In addition, companies from several Member States are developing SMR designs (Czech Republic, Denmark, France, Italy, Luxembourg, Poland and Sweden).

[2] Examples of current Euratom-funded projects focusing on SMRs nuclear safety are ELSMOR, McSAFER, CC-SMART, GEMINI+ with a total Euratom contribution of EUR 15 M. DG ENER established in December 2021 the Inter-Service Working Group (ISWG) to prepare and coordinate EC representation in view of launching a “European Small Modular Reactors (SMRs) Partnership” with EU stakeholders (industry, research organisation, European Regulators).

Within this context, our services (DG ENER, DG R&I and JRC) are looking at how to deploy SMRs in Europe, focusing on R&I issues that will promote industrial cooperation and build a stronger EU industry.[3] In our next Euratom work programme for 2023-25, we expect to invest EUR 20 M for SMRs research and innovation.

European industry is responding to this emerging demand with several EU SMR designs being already under development. The European Nuclear Safety Regulators Group (ENSREG) is working on possible licensing of SMRs.

Nuclear technologies could benefit from R&I developments in robotics and Artificial Intelligence (AI) combined with high-performance computing. AI in the nuclear sector has been expanding considerably in the last few years.

The know-how and expertise that is gained from applying AI-enabled digital tools to the nuclear industry have the potential to be fruitfully transferred to other sectors. We should therefore establish appropriate channels to facilitate those cross-sectorial synergies and the transfer of knowledge and expertise.

[Euratom as a pan-European framework to work together]

I am very pleased to share with you that the Euratom programme is and will fund to 2025, research and training activities in fission and fusion with EUR 1.4 billion. And funding should be further extended up to 2027 to align with Horizon Europe and the Multiannual Financial Framework of the EU. Political discussions will start next year with Member States on this extension.

Euratom provides a platform to work together on the common pan-European objectives of ensuring the safe and sustainable use of nuclear technologies. In few days, we will announce a Topic of EUR 10 M for diversifying the supply of nuclear fuel for VVER reactors currently coming from Russia.

For more than 65 years, Euratom has been the framework in which knowledge and competence in nuclear science and technology have been developed in Europe and through International Cooperation. Let me mention the excellent relations that we have with the OECD’s Nuclear Energy Agency (NEA) and the International Atomic Energy Agency (IAEA). Brussels, Paris and Vienna are today on the same *longueur d’onde*.

The EU has become the first major regional actor with a legally binding regulatory framework for nuclear safety following the implementation of the Euratom Directives on basic safety standards, on radiation protection and on radioactive waste management.

Euratom is supporting all EU Member States to meet equally high standards of safety, radiation protection, waste management and safeguards and continuously maintain high-level of competences, underpinned by sound and advanced research and innovation.

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The Euratom Programme is mainly implemented through three co-funded European Partnerships involving EU Member States, with research funders and public authorities:

- the EURAD Partnership for Radioactive Waste Management;
- PIANOFORTE for Radiation Protection, placing a great emphasis on medical applications;
- And EUROfusion for Fusion energy research.

I am also pleased to announce that discussions are currently advancing with Member States on the Euratom support to a future European Partnership on Nuclear Materials.

In addition, the current Euratom Programme is funding several innovative cross-sectoral projects to promote synergies and new applications between nuclear and other sectors for EUR 10 Million including space and hydrogen. Hydrogen in particular, is emerging as a potential way to decarbonise hard-to-abate energy intensive sectors.

Nuclear technologies can support the industry needs for decarbonised heat and hydrogen by providing resilience to the electrical grid and complementing renewables in the supply of low-carbon electricity at affordable prices. They can support the decarbonisation of several applications that require heat, such as district heating and desalination.

With high and very high temperatures (above 1000 degrees Celsius), nuclear technologies can be used for industrial applications in the chemical sectors, for steel, cement, glass and paper production.

Another area that best exemplifies how important it is to build bridges between the nuclear sector and other sectors is the area of health. Rradiological and nuclear technologies play an important role in modern healthcare. In the EU alone, each year around 500 million medical procedures use ionising radiation. And 50% of cancer patients benefit from radiotherapy.

The EU is also the world’s leading supplier of medical radio-nuclides with a 60% market share of the global demand for some of the most widely used radio-isotopes used in diagnostics and therapeutics.

The current Euratom Programme puts a stronger emphasis on supporting research for the protection of patients benefiting from medical diagnoses and treatments using radiation sources. The programme is reinforcing the synergies between Euratom Research and the Health cluster of Horizon Europe by contributing to Europe’s Beating Cancer Plan and the EU Mission on Cancer. It also directly supports the Commission Strategic Agenda for Medical Ionising Radiation Applications (SAMIRA).

[Euratom leveraging the Research & Innovation potential for training and the development of advanced skills]

In the coming decades, various uses of nuclear science and technology will require highly educated personnel with very specific knowledge, skills and competences.

The profile of the coming generations of nuclear experts will be changing, as they will have to adapt to the digital transformation that will accompany these new technologies.

These aspects concern not only the energy sector but also medical and other applications making use of ionising radiations as well as fusion energy research.

The nuclear sector suffers from an ageing workforce. Some countries are faced by a declining interest by young researchers and students to enrol in the field. We need to act!

I take this opportunity to remind that 2022 has been declared the ‘European Year of Youth’. Under this initiative, I am pleased to announce that today we are launching a new European social media campaign to attract younger generations to the nuclear field.

We have produced a short video including eight young nuclear talents. Let me show you this **2 minutes video** on *Young professionals in the nuclear field.* I hope that you will like it and if you do, please share it on your social media. The nuclear sector needs youth!

Ladies and gentlemen, young talents are crucial for Europe to maintain our world leadership in nuclear safety and waste management and the highest level of protection from radiation.

All stakeholders, including industry and regulators will need to play a vital role in ensuring that qualified and experienced staff continue to be available for the nuclear sector.

The Euratom Programme is going to support two new large initiatives on nuclear education and training:

- OFFERR, the ‘European platform for accessing nuclear R&D facilities’ will establish an operational scheme to facilitate access for researchers and industry to key nuclear science infrastructures in Europe.

- ENEN2plus means ‘Building European Nuclear Competence through continuous Advanced and Structured Education and Training Actions’. ENEN2plus is the largest and most integrative nuclear Education and Training effort up to date. It supports cross-border and cross-disciplinary mobility within and beyond EU in cooperation with the Commission Joint Research Centre, with the Nuclear Energy Agency of the OECD, and with international partners including the United States, Korea and Japan.

[Conclusions]

FISA and EURADWASTE conferences have always been a major milestone on the Euratom agenda.

Their success lies in summarising the state of play of R&D on fission safety of reactor systems and radioactive waste management, highlighting major achievements and providing recommendations for the future.

The conferences are also fora to simulate discussions on the key needs in research and innovation policies addressed at national, European and international levels, promoting crosscutting synergies and partnerships within the nuclear sector and beyond.

I would therefore like to conclude by threes words, by three ‘R’ that I hope will remain in your mind for this conference:

- Research;
- Resilience, including for preparing the next generation of nuclear talents;
- Repower, for keeping our European strategic autonomy and decarbonizing our continent.

Thank you and enjoy the FISA-EURADWASTE conference.

1950 words

13 minutes’ keynote + 2 minutes of Euratom video