



## **TABLE OF CONTENTS**

Message from MEP Tomas Tobé	4-5 6-7 8-9
Message from our President	
Message from our Director General	
The voice of the nuclear industry	10
Who we are	11
What we do	11
Our members	11
The Executive Board	12
Meet the team	12 - 13
Policy Focus	14
Sustainability	15
Energy Crisis	16
European Green Deal	17
Small Modular Reactors	18
European Nuclear Energy Ecosystem	18
Education & Training	18
Supply Chain Optimisation	19
Radioactive Waste Management	19
Aarhus Convention	19
EU funded projects	20
ENEN2Plus	21
NPHyCo	21
RIMA	21
SNETP	22
TANDEM	22
European Nuclear Installations Safety Standards Initiative (ENISS)	24-26
Communications & Advocacy	28-33
International Presence & Alliances	34-35

## MESSAGE FROM MEP TOMAS TOBÉ



Nuclear power is "climate-smart". This was the message on one of my campaign posters in the 2019 European elections campaign. As a front-runner candidate for the Swedish Moderate Party, I campaigned for more nuclear power in Sweden and the EU. To us, it was clear that nuclear power is critical in order to solve climate change and make European businesses more competitive, due to its minimal carbon footprint and high energy efficiency. However, at the time, this message was met with scepticism. Instead of realising the great potential of nuclear power to meet the major challenges of our time, providing a viable solution to climate change, our critics argued the opposite. Those who stated this were wrong, to say the least.

Nuclear energy and security of supply is now at the centre of the European political debate. Of course, this is due to the energy crisis that erupted because of Russia's illegal war of aggression against Ukraine. However, it is also due to the common goal of making Europe the world's first climate neutral continent. This has led to an increased focus on fossil free energy sources, such as nuclear, which has a crucial role to play in the decarbonisation of our societies whilst providing greater security of energy supply.

There also seems to be a shift in attitude in the European Parliament towards nuclear power. Last year, a majority voted in favour of nuclear power, notably in the votes on the EU's Sustainable Finance Taxonomy and the revised Emissions Trading System.

This shift is important. At a time when Europe needs massive investments in research and development of new technologies, and in the renovation and refurbishment of existing nuclear power plants, the EU cannot enact legislation that does not take a technology-neutral approach.

Sweden's new centre-right government has this approach at its core. During the first 100 days in office, the Government has taken initiatives to remove obstacles to build new nuclear power plants in Sweden and started the process of redesigning our aim in energy policy. Instead of 100 percent renewable, it will be 100 percent fossil-free.

To me it is clear that the EU needs both more renewable energy sources and more nuclear power. The EU needs to invest more in research and development, especially when it comes to small modular reactors. The Euratom Research & Training programme should get more funding. Investments are also required in infrastructure that enables increased transmission of electricity between European countries. Safeguarding technological neutrality in all EU legislation is crucial.

We have come a long way in the nuclear debate since the last European elections. The critics have been proven wrong and it is clear that nuclear power is vital in the fight against climate change and in order to ensure security of supply. The EU should not stand in the way, but rather enable the research and investments needed to unlock the potential of nuclear energy.

Tomas Tobé, Swedish Member of the European Parliament (EPP Group)

## MESSAGE FROM OUR PRESIDENT



On 16 June 1972, in Stockholm, Sweden, the first Human Environment Conference took place. Twenty years later, from 3-14 June 1992, the Earth Summit was held in Rio de Janeiro, Brazil. On the occasion of these two anniversaries in 2022, if we compare the current situation - solely through the prism of energy consumption - with that of thirty and fifty years ago, energy needs have increased on a global scale: +150% for oil, +200% for coal and fossil gas, +200% for hydropower and +650% for other renewables¹. Nuclear power production has also increased by 150% with a hundred operational power reactors in the world in 1972 compared to 438 in 2022 plus a further 56 under construction leading to a total current net installed capacity of about 400GWe, generating 2700TWh². In addition, with regards to renewable energy, 800GWe of additional onshore and offshore wind power has been installed, generating 1500TWh³. In 50 years, the energy mix and share of electricity has changed in a spectacular manner. In order to meet the Paris agreement and to achieve "net zero", the nuclear industry has to continue to pave the way towards this goal in 2050. Let us now look at the main actions taken by nucleareurope in this respect in Europe in 2022.

To achieve carbon neutrality by 2050 in the European Union, nucleareurope has called on policymakers to adopt a scientific approach. The massive deployment of renewable energies which are mainly weather dependent, induces risks for security of supply and reliability of the system. To mitigate such risks, these low-carbon energy technologies have to be combined with a non-weather dependent, dispatchable, flexible and, of course, low-carbon technology.

<sup>&</sup>lt;sup>1</sup>Source: BP Energy Outlook

<sup>&</sup>lt;sup>2</sup>Source: PRIS (Power Reactor Information System)

<sup>&</sup>lt;sup>3</sup>Source: IRENA (International Renewable Energy Agency)

A scientific approach should consider assessing low-carbon technologies (i.e., hydro, solar, wind, bioenergy, hydrogen, nuclear) according to the same criteria, without any preconceptions. Today, we should be pleased that this is the case! Indeed, the European Green Deal calls for technology neutrality and makes reference to recognized sustainability metrics to demonstrate how different energy sources and technologies can contribute to achieving the net-zero objectives in 2050. It appears that nuclear energy is a suitable partner for renewable energies and the only technology that provides an affordable decarbonization policy while ensuring Europe's energy transition under safe supply conditions.

Therefore, nucleareurope has also promoted the following policy in 2022: opportunities offered by the prolongation of the existing nuclear fleet's lifespan by performing long-term operation. The early phaseout of nuclear plants in Belgium, Germany and France, and their replacement with fossil fuel facilities could hamper the EU's goals of reducing greenhouse gas emissions by 55% in 2030, achieving carbon neutrality by 2050 and ensuring security of electricity supply. This is especially true in countries which have failed to significantly reduce emissions and remain heavily dependent on fossil fuels despite massive investments in renewable energy. Europe's energy system will benefit from the life-time extension of nuclear power plants in terms of availability, flexibility, reliability, low investment risks, low cost of grid integration, economic and social sustainability, maintaining a skilled workforce and supply chain. Together with nucleareurope, we must all continue to spread these messages.

In the near future, small modular reactors (SMRs) and advanced modular reactors (AMRs) will also contribute to the 2050 net-zero goals while offering opportunities for new applications such as industrial heat, seawater desalination, chemical processes, district heating, and green hydrogen production. Some European countries have expressed interest in SMRs. Thus, Europe has to create the industrial and economic market to ensure their timely development. This is why nucleareurope is highlighting the advantages of, for example, proven technologies, such as light water reactors, underlining that modularization, standardization and factory-based construction will maximize the economies of series production, and take advantage of the well-established fuel supply chain in Europe.

At last, but not least, nucleareurope co-signed an open letter with EU industries calling for low-carbon hydrogen produced by electrolysis to become eligible under the hydrogen targets. Indeed, low-carbon hydrogen will play an important role in decarbonizing the economy. Nucleareurope believes that hydrogen should be classified based on a detailed life-cycle assessment of the carbon intensity of the sources used to produce it, inline with the taxonomy.

As we have seen from these examples of key actions, nucleareurope carried out a lot of work in 2022. In 2023, nucleareurope will pursue its actions focusing on three main priorities (and related actions): Sustainability (taxonomy, international initiatives, ...), Energy crisis and how nuclear can help tackle it (nuclear promotion, role of low-carbon hydrogen, energy market design), and Preparing for a nuclear revival (SMRs, increase visibility of nucleareurope, relations across the EU industry, including with other sectors). I am personally convinced that nucleareurope will achieve all these top priorities, each of which has a detailed action plan to implement. I reiterate my confidence in nucleareurope which will face another challenging year. And finally, I want to believe that the EU will continue to remember this statement: "(...) All energy sources will need to be used in ways that respect the atmosphere, human health and the environment as a whole."<sup>4</sup>

Jean-Michel Quilichini, nucleareurope President

ANNUAL REPORT 2022 7

<sup>&</sup>lt;sup>4</sup>Source: Report of the United Nations Conference on Environment and Development, Volume I. Resolutions Adopted by the Conference, Rio de Janeiro, 3-14 June 1992

## MESSAGE FROM OUR DIRECTOR GENERAL



# LET'S MAKE 2023 THE YEAR OF NUCLEAR!

2022 saw many developments, some positive but also some which were much less so.

I would like to start by saying that our thoughts are with the people in Ukraine and, in particular, with all our colleagues in the nuclear sector, such as in Energoatom and the Ukranian Nuclear Forum. Unfortunately, the Ukraine crisis is showing no signs of coming to an end in the near future. And its impact continues to be felt throughout the EU energy market – and economy - as a whole. In this respect, nucleareurope fully supports the work of the International Atomic Energy Agency and in particular calls for an immediate halt in the use of force around Ukraine's nuclear power plants. We urge both sides to agree to the implementation of Nuclear Safety and Security Protection Zone around the Zaporizhzhya Nuclear Power Plant (ZNPP) as proposed by the IAEA as soon as possible.

As a result of the conflict in Ukraine, the energy crisis which has been bubbling away for the past two years has been

exacerbated. Already in 2020, there were indications that energy prices were on the rise, with dramatic increases hitting Europe in March 2022.

One thing that we have learnt as a result of all this is that Europe needs to become much more self-sufficient, particularly in terms of energy and the supply chains which will support a competitive industrial base. Today, our focus should not be on what went wrong – what we need to do is implement real solutions that will ensure we have a robust energy system and a strong European industry. To do this, all technologies need to be considered and made use of in areas where they will bring the greatest benefits.

In order to ensure a steady supply of affordable and decarbonised energy, we need an energy mix composed of renewables and nuclear. The benefits of bringing together these technologies are multiple:

- They are low-carbon and so will help Europe meet its decarbonisation targets.
- Together, they will ensure that energy is available 24/7 as this mix combines variable with flexible and dispatchable sources.
- They reduce dependence on fossil fuel imports.
- They help ensure more stable and affordable energy prices, as whilst they come with high upfront costs, operation costs are low.

Last year we saw a growing number of citizens and Member States recognise the points above, resulting in a more positive discussion around nuclear. Some countries had already started reflecting on a return to nuclear before the energy crisis erupted. Take for example the Netherlands who over the past couple of years has been gradually taking steps towards building new nuclear capacity, potentially both large and small. Others have had to rapidly review their nuclear phase out plans as a result of the current crisis (namely Belgium). At the same time, we are seeing more and more public opinion surveys which show that a majority of citizens support nuclear – even in Germany!

And of course, we must not forget that we were successful in ensuring that the EU's Sustainable Finance initiative listened to the science and included nuclear (albeit under very strict conditions). This just goes to show how successful we can be when we all work together – and it also gave a voice to a broader range of stakeholders to express their support for nuclear, including both trade unions and some NGOs.

What we need to do now is put forward practical solutions during the discussions at EU level. Our goal should be to ensure that we are supporting (and financing) all those technologies which are going to navigate us out of the current crisis. But we must not focus on the short-term – we need to make sure that the decisions we take today will also prevent such a crisis in the future. And this is going to require a series of long-term measures.

Yves Desbazeille, nucleareurope Director General

# THE VOICE OF THE EUROPEAN NUCLEAR INDUSTRY



## WHO WE ARE

nucleareurope is the Brussels-based trade association for the nuclear industry in Europe. It acts as the voice of the European nuclear industry in policy discussions with EU institutions and other key stakeholders.

The nuclear industry can only interact with international institutions and its representatives if the bridge between us and them is kept permanently open and continuously serves as a two-way channel for ideas, opinions and open debate. Continuous representation is crucial to nucleareurope maintaining its status as a constructive and proactive dialogue partner for EU policymakers.

## WHAT WE DO

nucleareurope provides information and expertise on the role of nuclear energy. We engage proactively at EU level on key nuclear matters by producing position papers, statements, newsfeeds, infographics, responses to public consultations and analyses of EU proposals and public opinion. We organise regular networking events such as dinner debates, workshops, one-to-one meetings, press briefings and visits to nuclear facilities.

Some of the key topics we deal with include security of energy supply, sustainability, competitiveness, economics of nuclear, nuclear safety, nuclear liability, radioactive waste management, nuclear transport, environment, enabling factors for new nuclear projects, R&D, energy mix, non-proliferation, public opinion, EURATOM Treaty and emergency preparedness.

## **OUR MEMBERS**

The membership of nucleareurope is made up of 15 national nuclear associations active across Europe and the companies that they represent, and six corporate members. More than 3,000 companies are represented, from Europe's (and the world's) largest nuclear utilities and nuclear fuel cycle companies to undertakings engaged in the transport of nuclear materials and the management of radioactive waste:

- Nuclear utilities
- Engineering companies
- Plant decommissioning companies
- Lawyers, consulting, insurance and service companies
- Uranium mining, milling and enrichment companies
- Nuclear fuel fabricators
- Spent nuclear fuel reprocessing companies
- Nuclear transporters
- Reactor and component vendors
- Waste management companies

- Belgian Nuclear Forum
- Bulgarian Atomic Forum
- Finnish Energy Industries
- French Atomic Industrial Forum
- Hungarian Nuclear Forum
- Italian Nuclear Association
- Nucleair Nederland
- Nuclear Industry Association UK

- Romanian Atomic Forum
- Slovak Nuclear Forum
- Slovenian Nuclear Forum
- Spanish Nuclear Industry Forum
- Swedish Atomic Forum
- Swiss Nuclear Forum
- Ukrainian Nuclear Forum Association

CEZ (Czech Republic), Fermi Energia (Estonia), KGHM (Poland), Nuvia (France), PEJ (Poland), Rolls-Royce SMR (UK) and Urenco (Global) are Corporate Members.

## THE EXECUTIVE BOARD

The Executive Officers are appointed by the General Assembly for a period of two years:

- Ignacio Araluce, FINE, Spain
- Hans-Ulrich Bigler, Swiss Nuclear Forum, Switzerland
- Csaba Kiss, Hungarian Nuclear Forum, Hungary
- Teodor Chirica, ROMATOM, Romania

- Denis Dumont, BNF, Belgium
- Christopher Eckerberg, SAFO, Sweden
- Esa Hyvarinen, ET (Past President), Finland
- Jean-Michel Quilichini, GIFEN, France

## **MEET THE TEAM**



Guilherme Cardoso Nuclear Technology Advisor



Sophie Dayraut Communication & Advocacy Manager



Danielle de Crombrugghe-L. Support Team Manager



Graziella De Riddere IT Manager



Yves Desbazeille Director General



Vilma Djala Communications Officer



Nathalie Foriers Assistant



Muriel Glibert ENISS Manager



Andrei Goicea Policy Director



Quentin Heilmann Legal Advisor



Jessica Johnson Communication & Advocacy Director



Berta Picamal DG Office, Legal & Intl Relations Director



William Ranval ENISS Director



Aude Van Hille Reception Assistant

# **POLICY FOCUS**



### **SUSTAINABILITY**

After over three years working on the sustainable finance file, nucleareurope was delighted to announce in July 2022 that nuclear has been added to the EU Sustainable Finance Taxonomy, further to the adoption of the Complementary Delegated Act by both the Council and the European Parliament. Nevertheless, it is important to remember that the CDA puts forward very stringent criteria which projects will need to meet in order to be considered as taxonomy compliant.

This win has been achieved thanks to the great cooperation between nucleareurope, its members and supporters. As a result of a clear, simple and factbased series of timely actions, policymakers recognised that not only does nuclear support security of energy supply and the EU's decarbonisation targets, but that it is also a sustainable technology. For example, in the case of the European Parliament, a vast majority of Members of the European Parliament supported the CDA - much more than our best expectations. Thanks to this decision, it will hopefully make it easier for the European nuclear sector to have access to sustainable investment funds. Furthermore, we hope that in future when discussing EU funding programmes, nuclear will no longer find itself under the list of excluded technologies as is currently the case (for example, the Just Transition Fund).

At the same, and as mentioned, the criteria which apply to nuclear are very stringent and the industry has been focusing on how they should be interpreted with support from nucleareurope. Meetings were also held with the European Commission and the regulators (through the Western European Nuclear Regulators Association, WENRA) to discuss different technical aspects and the current state of play in relation to, for example, Accident-Tolerant Fuels (both existing fuels which meet this criteria and developments regarding enhanced-ATFs).

There are several positives to be take from this achievement. First of all, it brought together the European nuclear sector and enabled us to work in a coordinated manner to achieve our goal. It also gave a voice to the broader nuclear community and supporters – these included the Member States, Members of the European Parliament, Trade Unions, some NGOS and many others. And as a result of this file an ever-growing number of stakeholders have

become more aware about nuclear and the positive benefits which it can bring. We hope to continue to build upon this in the years to come to ensure that nuclear is treated on an equal footing with other low-carbon and sustainable technologies.

Furthermore, over the last couple of years several independent, scientific assessments highligthing nuclear as a sustainable and low-carbon technology have been published, confirming that the EU took the right decision. These include the European Commission's Joint Research Centre assessment of nuclear in relation to the taxonomy and the two accompanying opinions by the Article 31 Group of Experts in radioprotection and the Scientific Committee on Health, Environment and Emerging Risks (SCHEER), published in 2021. In addition, the United Nations Economic Commission for Europe (UNECE) presented the results of <a href="its Carbon Neutrality Project">its Carbon Neutrality Project</a> which also demonstrated nuclear to be both low-carbon and sustainable.

Other files which nucleareurope now continues to monitor include

- The EU Ecolabel for Retail Financial Products (which was put on hold awaiting the final decision on the CDA)
- The Corporate Sustainability Reporting Directive (which will ultimately replace the current Non-Financial Reporting Directive) and the standards currently under development by the European Financial Reporting Advisory Group (EFRAG).
- Proposals for an Extended Taxonomy, which will list a range of additional sectors to the list including mining.

Looking ahead, nucleareurope will now liaise with its members in terms of the reporting requirements that stem from the taxonomy, in order to gain an overview of how the different Member States are interpreting the Technical Screening Criteria which nuclear projects need to meet in order to be report as both taxonomy eligible and aligned. Furthermore, we are now planning to delve into the different aspects of uranium mining in order to be prepared in the event work on the extended taxonomy moves ahead at EU level.

### **ENERGY CRISIS**

The past couple of years have been marked by a growing energy crisis, which has since been exacerbated by the conflict in Ukraine. Citizens and business are being confronted with massive energy bills, and some Member States have started to prepare for potential blackouts due to a lack of power supplies. As a result, Europe is now reflecting on potential solutions to help render energy prices more affordable and ensure security of supply. Furthermore, it is also considering a review of the Electricity Market Design, as many feel that it is no longer fit for purpose.

Nucleareurope has remained a vocal actor in the debate throughout. In our opinion, the EU needs to implement measures which bring not only a short term solution to tackle the current crisis, but also a long-term vision which will help prevent such a crisis from arising in the future. To do this, the focus should be on reducing Europe's dependence on foreign energy imports, such as oil and gas, and supporting 'homegrown' sources such as wind, solar and nuclear. Europe will need to significantly build up its energy capacity, and this will require policies which will encourage investments in such additional capacity. On top of that, the electricity market needs to recognise and reward technologies, like nuclear, for the benefits which they bring by being available 24/7.

In terms of the measures implemented by the EU over the past year of relevance to nucleareurope, these can be summarised as follows:

• REPowerEU Communication 'Joint European Action for more affordable, secure and sustainable energy'. Published in March 2022, this communication outlines the areas which the EU plans to work on in order to tackle the crisis. Regrettably, its primary focus is on increasing renewables capacity, with nuclear only referenced as an alternative source of electricity for hydrogen production.

- REPowerEU Plan. Following on from the Communication, in May 2022 the Commission put forward a series of legislative proposals 'to rapidly reduce dependence on Russian fossil fuels and fast forward the green transition.' Here, the benefits of nuclear are covered to a limited extent as one of the recommendations put forward is to delay the phase-out of nuclear reactors in Europe. However, this only provides a solution in the relatively short term. If the EU really is committed to a long-term, stable and affordable supply of low-carbon energy, more needs to be done to support the development of new nuclear projects - and this aspect is missing from the plan.
- Regulation on an emergency intervention to address high energy prices. Adopted in October 2022, this regulation proposes a temporary EU revenue cap of €180 MWh of electricity produced from technologies such as nuclear and renewables.

Given that the Commission is expected to come forward with a proposal to review the Electricity Market Design this Spring, nucleareurope has also started to work on identifying potential measures which could help render the EMD fit for purpose and encourage investments in low-carbon technologies, such as nuclear and renewables, which have high upfront costs.

#### **EUROPEAN GREEN DEAL**

Launched at the end of 2019, the EU's <u>Green Deal</u> contains a number of ambitious packages with the goal of transitioning to a clean and circular economy. It was followed by the publication of a '<u>Fit For 55'</u> package in 2021 which included a broad range of legislative proposals.

As part of its outreach on these files nucleareurope continued to highlight the benefits which nuclear can bring in terms of reducing CO2, ensuring security of supply and affordable energy prices. Our focus has remained on the benefits of both extending the life of the existing nuclear fleet and embarking on a programme of new build projects. Our messaging has therefore centred around the following:

- Nuclear will help the EU achieve its decarbonisation targets, as it is low-carbon.
- Nuclear will enable an affordable transition, as it remains one of the cheapest sources of electricity.
- Nuclear will ensure security of supply, as nuclear power plants run virtually 24/7.
- Nuclear supports a socially fair transition, as it will help industries remain in Europe by providing them with a constant supply of low-carbon energy.

Over the course of 2022, nucleareurope focused on those legislative proposals of greatest relevance to the nuclear, (some of which also stem from the REPowerEU plan) namely:

- Revision of the Renewable Energy Directive.
  A proposal was put forward in 2022 to potentially increase the 2030 target for renewables from 38%-40% to 45%
- Revision of the Third Energy Package for Gas.
  Nucleareurope has been closely monitoring this file to see how, and whether, it will impact low-carbon hydrogen production.

One topic of particular relevance to these discussions is <u>low-carbon hydrogen</u>. Nucleareurope has therefore been actively engaging with its members to develop its position on this matter. Actions which have been identified and will be continued over the course of this year include:

 Supporting advocacy efforts and raising public awareness about the benefits of producing hydrogen with nuclear power.

- Establishing contacts with relevant stakeholder in the hydrogen supply chain.
- Engaging with national regulators.
- Building a Knowledge Hub.
- Identifying key challenges and potential solutions.

As part of this, nucleareurope is a member of the European Clean Hydrogen Alliance (ECH2A) and the Hydrogen Production roundtable. Here our goal is to ensure recognition for low-carbon hydrogen and the role it can play in supporting industry and transport. Furthermore, as part of this roundtable, nucleareurope participated in a meeting with DG Grow where issues such as the need to tackle potential barriers in terms of standardisation and the granting of permits for hydrogen production facilities, as well as ensuring access to a skilled workforce.

Nucleareurope also co-signed a letter to policymakers calling for their support in including low-carbon hydrogen in relevant EU policies alongside renewables.

Furthermore, the Commission launched its 'Investors Dialogue on Energy' initiative which brings together experts from the energy industry and the financial sector and is composed of 5 Working Groups tackling: Energy production, Transmission and distribution, Energy storage, Heating and cooling and Services and prosumers. Nucleareurope is represented on the Working Group dedicated to Energy Production. So far, this group has discussed financing business models in the energy production sector, renewable hydrogen and the upcoming emergency measures.

## SMALL MODULAR REACTORS (SMR's)

In 2022, nucleareurope issued a position paper highlighting the benefits which SMRs can bring to Europe's energy system. These include helping to reduce CO2 emissions, ensuring security of energy supplies, bring stability to the grid and energy markets, and potentially support industrial development and job creation. It also highlights the need for a harmonised 'domestic' SMR European program which takes into account the whole value chain (applicable also to existing foreign technologies). To achieve this, the EU will have to build its own capacity in order to become a leading actor in the future SMR market and create industrial and economic value at a European scale.

One major development in 2022 was the establishment of a European SMR Pre-Partnership. The goal of this

partnership is to identify the conditions which will enable the safe design, construction and operation of SMRs in Europe over the next decade and beyond. There are already a large number of SMR designs and technologies under development both in Europe and worldwide. Given the EU's unique experience and expertise in nuclear technology, engaging in the commercial deployment of SMR projects will help strengthen European industrial and research capacities and reduce Europe's dependence on foreign industries.

Nucleareurope is a key partner in this project, chairing not only the Steering Committee but also in charge of several Workstreams. More information about this partnership and our involvement can be found here.

## **EUROPEAN NUCLEAR ENERGY ECOSYSTEM**

In 2022, the European Commission hired consultants Deloitte to assess the Europe nuclear energy ecosystem and identify whether it is 'fit for the EU's climate objectives'. As a key stakeholder in the process, nucleareurope has provided feedback to the consultants on the following topics:

- The economic contribution of nuclear power in terms of job creation, GDP growth and export opportunities.
- The need to ensure a political and regulatory framework that encourages new build projects.
- The importance of financing and investing play a significant role in terms of final production costs.

- The need to have access to a highly skilled workforce for both the construction and operational phases of a nuclear power plant.
- Areas to be considered when conducting research into prospective new technologies (for example, reactors technologies, human resources, etc.).
- The need for available nuclear waste repositories in order to manage nuclear waste.
- The importance of decommissioning to the life cycle of a nuclear power plant.

## **EDUCATION & TRAINING**

One of the challenges which the nuclear sector is increasingly facing is a skills shortage. As such, the work being undertaken by nucleareurope and its members aims to identify the industry's needs in terms of a skilled workforce and finding ways of making the sector more attractive to young people. In this respect, nucleareurope is a member of the <u>European Human Resources Observatory</u> for the Nuclear Sector (EHRO-N) Advisory Board. EHRO-N is a unit under the

Commission's Joint Research Centre dedicated to the knowledge management of competences and human resources in the nuclear sector. Furthermore, the sector continues to look into potential opportunities in terms of reconverting workers from other sectors, such as the coal industry, in order to provide them with the right skills and encourage them to work in the nuclear sector.

### SUPPLY CHAIN OPTIMISATION

In 2022, nucleareurope published a <u>European</u> Guideline for the Use of High-Quality Industrial Grade Items in Nuclear Facilities. This Guideline aims to be the foundation from which nuclear licensees and third parties would to be able to develop their own processes and procedures. It's goal is to help support the safety, quality and cost competitiveness of the industry by clearly prescribing the proven ways in which commercial grade items and their suppliers should be verified. Furthermore, the sustainability of

the nuclear industry will be enabled by creating a harmonized procurement approach for existing and future licensed operating organizations.

This Guideline also formed the basis of the discussions during the 17th edition of the nucleareurope-IAEA joint event entitled "Towards a sustainable nuclear supply chain" Forum (held in Finland in September 2022).

### RADIOACTIVE WASTE MANAGEMENT

Further to the publication in 2020 of a toolkit highlighting how the nuclear sector applies a circular economy approach to nuclear, nucleareurope focused on the development of four background papers to complement the toolkit. Published in September 2022, they focus on:

- 1. Radioactive Waste and Spent Fuel.
- 2. Decommissioning.
- 3. Deep Geological Repositories.
- 4. Clearance of Materials.

Work has also now started on a paper dedicated to the financing of decommissioning. All these documents can be found here.

## **AARHUS CONVENTION**

In 2021, the Aarhus Convention Compliance Committee found the EU to be in breach of the Convention, particularly in relation to access to justice linked to state aid decisions. Based on this, in 2022, the European Commission launched a public consultation entitled "The Aarhus Convention and State Aid measures: analysis and assessment of options". As part of this process, three different legislative proposals were put forward as a potential solution, namely:

 Amendment of the Aarhus Regulation to include state aid in the scope of its internal review process.

- Amendment of the State Aid Best Practice Code to provide for an internal review process similar to the one under the Aarhus Regulation.
- 3. Amendment of the Council State Aid Procedural Regulation to provide for an internal review process similar to the one under the Aarhus Regulation.

In its response to the consultation, nucleareurope expressed the view that the third option would be the most appropriate, and stressed the need to ensure legal certainty for Member States and nuclear projects.

## **EU FUNDED PROJECTS**



Nucleareurope is involved in a series of projects and partnerships, some of which are funded by the EU. Regarding EU funds, Horizon Europe is the EU's key funding programme for research and innovation. It tackles climate change, helps to achieve the UN's Sustainable Development Goals and boosts the EU's competitiveness and growth. The total budget of Horizon Europe is €95.5 billion. Around €1.38 billion of this is dedicated to EU-funded research on nuclear issues, under the Euratom Treaty (Euratom Research and Training Programme). The share of this allocated to nuclear fission and radioprotection indirect actions, i.e. open to nuclear industry participation, is €288 million. The Euratom programme runs from 1 January 2021 – 31 December 2025.

Below is an overview of some of the EU funded projects in which nucleareurope is involved.

## **ENEN2PLUS** (BUILDING EUROPEAN NUCLEAR COMPETENCE THROUGH CONTINUOUS ADVANCED AND STRUCTURED EDUCATION AND TRAINING ACTIONS)

The kick-off meeting of the ENEN2Plus project took place online in June 2022. This four-year project focuses on nuclear Education and Training. It aims to attract more people to nuclear through E&T, crosscultural and cross-disciplinary. For example, it will organise career-related events and competitions and enable a strong mobility programme. Nucleareurope is involved in this project in several areas:

- Task lead in the Work Package dedicated to identifying future human resources needs and potential skills gaps.
- Supporting and promoting relevant events and competitions.
- Identify a sustainable way of financing the continuation of the mobility programme.

## NPHYCO (NUCLEAR POWERED HYDROGEN COGENERATION)

The kick-off meeting of the NPHyCo project took place in Germany in October 2022. This two- and half-year project focuses on the potential for developing large scale, low-carbon, hydrogen production facilities linked to nuclear power plants. It will start by assessing the feasibility of producing hydrogen near an existing nuclear power plant as well as the added value of such project. Furthermore, it will look at potential locations where a pilot project could be implemented. Nucleareurope is involved in this project in several areas:

- Leader of the Work Package dedicated to communication and dissemination activities.
   We will be working with the project partners (and the nucleareurope Communications & Advocacy Committee) on this. So far, several communication tools have been produced, including a logo and a dedicated website.
- Contributor to the task on "Establishing a frame of reference for the project", defining the EU hydrogen market.

## RIMA (ROBOTICS FOR INSPECTION AND MAINTENANCE)

Nucleareurope is actively involved as a partner in the RIMA project, funded under the Horizon 2020 programme, focused on driving innovation in robotics for inspection and maintenance (I&M). The main objective of the project is to reinforce the leadership of Europe in I&M robotics by fostering efficient cooperation in Europe. Nucleareurope's role is to bridge the gap between SMEs within the robotics community, and potential end users within the nuclear industry (licensees, I&M service providers, operators). From nucleareurope's perspective, the project gives an opportunity to highlight selected "spin out/in" areas of innovation in the nuclear industry as well as to provide nucleareurope's members with a platform to cooperate with SMEs in order to work together on the challenges the industry faces. Robotics can help operational nuclear power plants, aid I&M, increase efficiency,

reduce time consumption, facilitate achieving selected tasks and thus improve productivity and safety operations. Among other activities under the initiative, nucleareurope is following and acting as a reviewer for 3 projects under RIMA:

- Demzone: a robotic system that collects samples of dust by drilling walls of nuclear installations and measures the radioactive contamination in them. The development phase of the project finished in November 2022 and the prototype will be tested shortly in CEA installations.
- Spiider: Unmanned Autonomous Vehicle for inspection of high radiation zones. In progress.
- Romy: robotic mapping system to create 3D digital twins of installations. In progress.

ANNUAL REPORT 2022 21

## **SNETPFORWARD** (SUSTAINABLE NUCLEAR ENERGY TECHNOLOGY PLATFORM)

The aim of SNETP-FORWARD project is to help the association consolidating its structure, strengthening its position in the Set-plan and among the European ETIPs, enhancing its ability to interact with the European and International associations and organisation and last but not least to be engaged in the innovation world by boosting the innovation

capacities of its members. The kick-off meeting took place in June in France, in conjunction with the SNETP annual Forum. Nucleareurope is involved in the work packages dealing with "Strengthening interactions with European & international stakeholders" and the one on specific studies that will support the nuclear research developments at EU level.

## **TANDEM** (SMALL MODULAR REACTOR FOR A EUROPEAN SAFE AND DECARBONIZED ENERGY MIX)

The kick-off meeting of the TANDEM project took place in France in September 2022. This three-year project focuses on the integration of Small Modular Reactors within hybrid energy systems to provide not only electricity, but also heat and hydrogen. Nucleareurope is involved in this project in several areas:

- Leader of the Work Package dedicated to communication and dissemination activities.
   We will be working with the project partners (and the nucleareurope Communications & Advocacy Committee) on this. So far, several communication tools have been produced, including a logo and a dedicated website.
- Leader of the task on "Analysis of the future European energy scenarios" and the deliverable on "Analysis of the key features of the future EU energy market and associated

- regional/national landscapes". The outcomes of this task will be proposed scenarios for the energy markets, highlighting the SMR developments.
- Leader of the task on "Context and targets of hybrid system techno-economic optimization" that will refine the context and targets for hybrid system techno-analysis.
- Involvement in the Work Package dedicated to skills and education of relevance to SMRs.
- Support in the organisation of a joint ELSMOR/TANDEM workshop in Brussels on 6 + 7 December 2022.

More information about the EU projects in which nucleareurope is involved can be found here.



# EUROPEAN NUCLEAR INSTALLATIONS SAFETY STANDARDS (ENISS)



ENISS represents the nuclear utilities and operating companies from 14 European countries with nuclear plants. ENISS provides the nuclear installations and license holders with the platform that it needs to exchange information on new national and European regulatory activities, to express its views and provide expert input on all aspects related to harmonization of safety standards. ENISS is the common channel through which European the nuclear industry interacts with WENRA (nuclear regulators), the European Institutions and the International Atomic Energy Agency (IAEA).

Although ENISS is hosted by nucleareurope, it enjoys a full autonomy as regards its strategy and priorities, which are discussed, approved and reviewed by its own supervisory bodies.

## WESTERN EUROPEAN NUCLEAR REGULATORS ASSOCIATION (WENRA)

WENRA intends to publish in 2024-2025 a new revision of the Safety Reference Levels (SRLs). WENRA is currently reviewing the existing SRLs aiming at identifying gaps and areas requiring revision.

ENISS has been invited to provide comments, suggestions for improvement and feedback based on the experience gained in implementing the WENRA SRLs. ENISS conducted a systematic review of all ENISS comments made on the 2014 and 2020 SRL revisions,

accounting for the ENISS position papers and other internal resources. A first set of comments was presented to and discussed with WENRA.

WENRA has been tasked by ENSREG to develop the technical specifications for the ENSREG topical peer review (TPR) on fire protection, as for the 1st TPR (2017). ENISS provided feedback during the preparation of the TPR specifications.

## **EUROPEAN NUCLEAR SAFETY REGULATORS GROUP (ENSREG)**

ENSREG launched on 13 April 2022 a public consultation on three draft documents related to the TPR II process: the ENSREG Stakeholder Engagement Plan, the Terms of Reference for the TPR process on fire protection and the WENRA Technical Specification for the National Assessment Reports.

ENISS responded to the public consultation.

ENSREG sixth regulatory conference took place in Brussels on 20-21 June 2022. The conference consisted of an opening session, an extraordinary session on Ukraine and four topical sessions. ENISS gave a speech on the licensees' expectations regarding new Nuclear Power Plant design licensing during the session dedicated to the topic: «New designs: regulatory challenges».

#### EU SMR PRE-PARTNERSHIP

Five workstreams have been set up under the prepartnership. ENISS is a member of workstream 2 on licensing which is led by regulators through ENSREG. The WS2 main objective is to identify the elements for establishing a European pre-licensing process based on commonly accepted safety assessments from different ENSREG members interested in the licensing of the same SMR design.

ANNUAL REPORT 2022 25

### **EUROPEAN COMMISSION**

The European Commission organised a workshop on the implementation of the Nuclear Safety Directive on 8-9 November 2022. The EC published in April 2022 its 2nd Progress Report on the progress made by the EU Member States with the implementation of the amended Nuclear Safety Directive. While good progress has been made in the Directive's implementation, the report identifies several areas where actions taken at EU level can bring added value in supporting Member States. The purpose of the

workshop was to exchange views on the report's findings and EC recommendations and to provide input to support the selection of topics to be addressed as a priority in 2023-2024. ENISS was provided with the opportunity to express during the workshop the licensees' views on "Strengthening the capabilities of licence holders". The workshop decided to take forward the following 3 topics: Regulators' independence, Nuclear Safety objective and Safety Culture.

## INTERNATIONAL ATOMIC ENERGY AGENCY (IAEA)

ENISS provided comments throughout the year to the IAEA Draft Safety Requirements and Safety Guides, addressing the most important issues, namely NPP design and operation, management systems, safety assessment, waste management, decommissioning

and radiation protection. ENISS furthermore provided the IAEA with assistance in the technical/consultancy groups and participated, as an observer, in the Agency's Safety Standards Committees (SSCs).

## INTERNATIONAL COMMISSION ON RADIOLOGICAL PROTECTION (ICRP)

The ICRP has started the process of preparing a review of the ICRP system of radiation protection. The intended aim is to approve by 2029 a new set of fundamental recommendations on radiological protection. Liaison organisations, including ENISS, have the opportunity to express their views on several occasions.

ENISS participated in the meeting of Senior Representatives of Organisations in Formal Relations with ICRP (SLO) which took place in Portugal 9 October 2022. The meeting mainly focused on the topics

identified as a priority for review to prepare the next General Recommendations. ENISS submitted prior to the meeting a statement outlining its views on the topics of RP optimisation and simplification, and LNT hypothesis. ENISS also attended the ICRP workshop on the System of Radiological Protection held on 10 October 2022. The workshop was an opportunity for organisations to share their views on what they consider the most important research topics in radiological protection for the medium and long term.

## **POSITION PAPERS**

ENISS had in 2022 the opportunity to present to WENRA and the IAEA its views set forth in the position paper on the Transition between Operation and Decommissioning which was published on the ENISS website in June 2022.

The ENISS high level statement calling to link emergency arrangements proportionately to risk evaluated using an agreed consistent approach was also presented in several conferences with stakeholder participation.

The ENISS Expert Group on Radiation Protection has focused its attention on the following topics: RP optimisation and simplification, and the LNT hypothesis. The Expert Group has finalised a statement on Avoid Unnecessary Complexity in Radiation Protection which will be published on the ENISS website and presented to ENISS Stakeholders in 2023.



# Join us on 20 & 21 June 2023 in Lyon for this year's #NuclearEurope2023 conference!

The event will kick-off with a dinner on the evening of 20 June, followed by a full day conference on 21 June.

The NuclearEurope2023 conference will focus on nuclear both as a strategic European industry and as an enabler for the larger low-carbon European industrial base. Topics to be covered include:

- Europe's competitiveness
- Energy sovereignty
- A strong European supply chain
- Role of nuclear in achieving the climate targets
- Extending the life of the existing nuclear fleet
- Nuclear new build
- Workforce and skills



ORGANISED BY NUCLEAREUROPE



**HOSTED BY GIFEN** 



## **COMMUNICATIONS & ADVOCACY**



Nucleareurope continued to use a broad range of communication tools, including one-to-one meetings, webinars, press releases, position papers, and social media, reiterating the point that nuclear is a low-carbon, dispatchable source of electricity which ensures security of energy supply and provides a significant number of jobs and strong economic contribution. At the same time, the energy crisis, which has been gradually escalating over the past two years, combined with the situation in Ukraine, has led to a change in conversation about nuclear in Europe. Given this, nuclear communication experts have been assessing key priorities for Europe's citizens in order to ensure that our messaging is inline with the ongoing conversations.

Below is a summary of some of the key communications actions undertaken over the past year.

## REBRANDING

In June 2022, we unveiled our rebranding, officially announcing the change from FORATOM to nucleareurope. The announcement took place during our annual conference in Helsinki and was well received by stakeholders. The decision to rebrand is linked to the fact that opinions towards nuclear are moving in a positive direction. Furthermore, given the growing range of stakeholders with whom we are interacting at EU level, it was agreed that our name should clearly indicate what we are about as an association. More information can be found <a href="here">here</a>.

## COP27

In November 2022, and in order to build upon the achievements in Glasgow in 2021, nucleareurope increased its presence at COP27 which took place in Sharm El Sheikh, Egypt. We provided support to the IAEA #Atoms4Climate pavilion and the Nuclear For Climate booths. As part of this we organised and spoke at a series of relevant events, including and official UNFCC sidebar dedicated to nuclear. We were onsite speaking to a broad range of stakeholders, providing general information about nuclear as well as engaging in conversations around climate change, financing,

sustainability and security of supply. Furthermore, thanks to the support of our members, stakeholders were able to enjoy a virtual reality tour of the CEZ Temelin nuclear power plant in the Czech Republic. Given the success of these Virtual Reality Goggles (especially amongst younger audiences and women) – and the interest expressed by the IAEA in having such a tool available for other nuclear power plants and facilities (eg the Onkalo DGR) we will now liaise with our Communications & Advocacy Committee to see what can be developed.

## **UKRAINE CRISIS**

The situation in Ukraine led to the activation of a low scale crisis communication plan during the first half of the year. This included:

- Internal communications.
  - Within nucleareurope.
  - nucleareurope Members.
- External communications.
  - broader nuclear industry.
  - broader public (see here).
  - European institutions and international partners.

We have since continued to monitor developments and communicate whenever necessary.

## **OUTREACH TO THE EUROPEAN PARLIAMENT**

nucleareurope continued to reach out to Members of the European Parliament on key files of importance to the sector. Contacts were primarily maintained with the Committee on Industry, Research and Energy (ITRE) and the Committee on the Environment, Public Health and Food Safety (ENVI) and covered, in particular, the Sustainable Finance Taxonomy, EU Green Bond Standard, Revision of the EU Emissions Trading Directive and the Gas package.

Nucleareurope also participated in several European Energy Forum debates in order to intervene during the discussions regarding the contribution of nuclear to, for example, achieving the 2050 decarbonisation targets and ensuring security of energy supplies.

### **EVENTS**

#### Nucleareurope 2022 - 6 & 7 June 2022 - Helsinki



17th edition of the nucleareurope-IAEA joint event on Management Systems 7-9 September 2022 – Helsinki, Finland



Below is an overview of some of the traditional tools which nucleareurope continued to make use of in order to support the association's advocacy goals.

## **NUCLEAREUROPE IN THE NEWS**





## Foratom proposes changes to Taxonomy CDA

12 January 2022

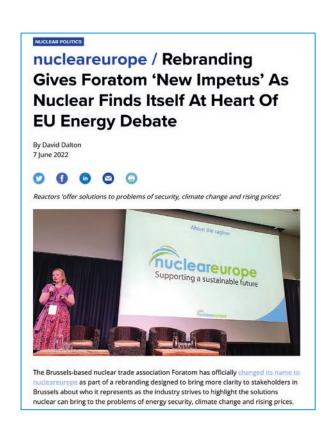


European nuclear trade body Foratom has welcomed the decision of the European Commission to include nuclear within the sustainable finance taxonomy under certain conditions. However, it has provided the Commission with some suggestions for improvement, based on analysis of the leaked draft Complementary Delegated Act (CDA).



The European Commission has extended the deadline for feedback. (Image: EC)

The Commission began consultations on 31 December with the Member States Expert Group on Sustainable Finance and the Sustainable Finance Platform on a draft text of a Taxonomy CDA covering certain gas and nuclear activities. This document was subsequently leaked and published by the media.



ANNUAL REPORT 2022 31

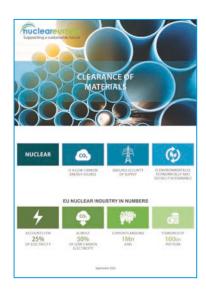
## **NUCLEAREUROPE VIEWS**





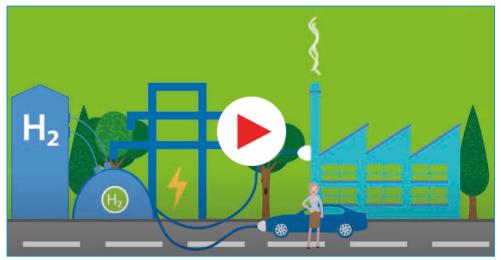








## **NUCLEAREUROPE VIDEO**



Low-Carbon Hydrogen

## **NUCLEAREUROPE SOCIAL MEDIA**









ANNUAL REPORT 2022 33

# INTERNATIONAL PRESENCE & ALLIANCES



nucleareurope is represented at meetings of a number of key nuclear-related organisations and alliances, including the European Nuclear Safety Regulators' Group (ENSREG), Sustainable Nuclear Energy Technology Platform (SNETP), European Nuclear Society (ENS), European Human Resources Observatory for Nuclear (EHRO-N), Implementing Geological Disposal of Radioactive Waste Technology Platform (IGDTP), International Atomic Energy Agency (IAEA) and the OECD's Nuclear Energy Agency (NEA). Below is a snapshot of just some of the activities nucleareurope was involved in in 2022.

# SUSTAINABLE NUCLEAR ENERGY TECHNOLOGY PLATFORM (SNETP)

The Sustainable Nuclear Energy Technology Platform was established in 2007 to coordinate nuclear fission research actions and to advise the European Commission on priorities for EU funding. It underlines the importance of the research dimension of the nuclear sector, the need to maintain high levels of safety, the importance of retaining competences and know-how and the increasingly competitive nature of this global industry.

Nucleareurope provides continued secretariat support to SNETP, including dissemination activities and support to the European Affairs and Industry committees. Furthermore, we collaborate with SNETP on the Strategic Energy Technology Plan, and actively participate in the Implementation Working Group (IWG) 10 on nuclear safety. In addition to our involvement in several projects of last year's Euratom Research and Training Programme call, nucleareurope will also follow the call for new projects for 2023-2025.



Forum Atomique Européen Avenue des Arts 56 1000 Brussels tel +32 2 502 45 95 www.nucleareurope.eu











