



NUCLEAR: INVESTING IN A COMPETENT WORKFORCE FOR THE BENEFIT OF SOCIETY

In order to maintain a European nuclear industry – which provides low-carbon energy and vital medical diagnosis and treatment – more needs to be done to ensure that there is a sufficient number of skilled people coming into the nuclear field

NUCLEAR



Is a low-carbon energy source



Ensures security of supply



Is environmentally, economically and socially sustainable

EU NUCLEAR INDUSTRY IN NUMBERS



Accounts for
26%
of electricity



Almost
50%
of low-carbon electricity



Supports around
1Mn
jobs



Turnover of
100bn
per year

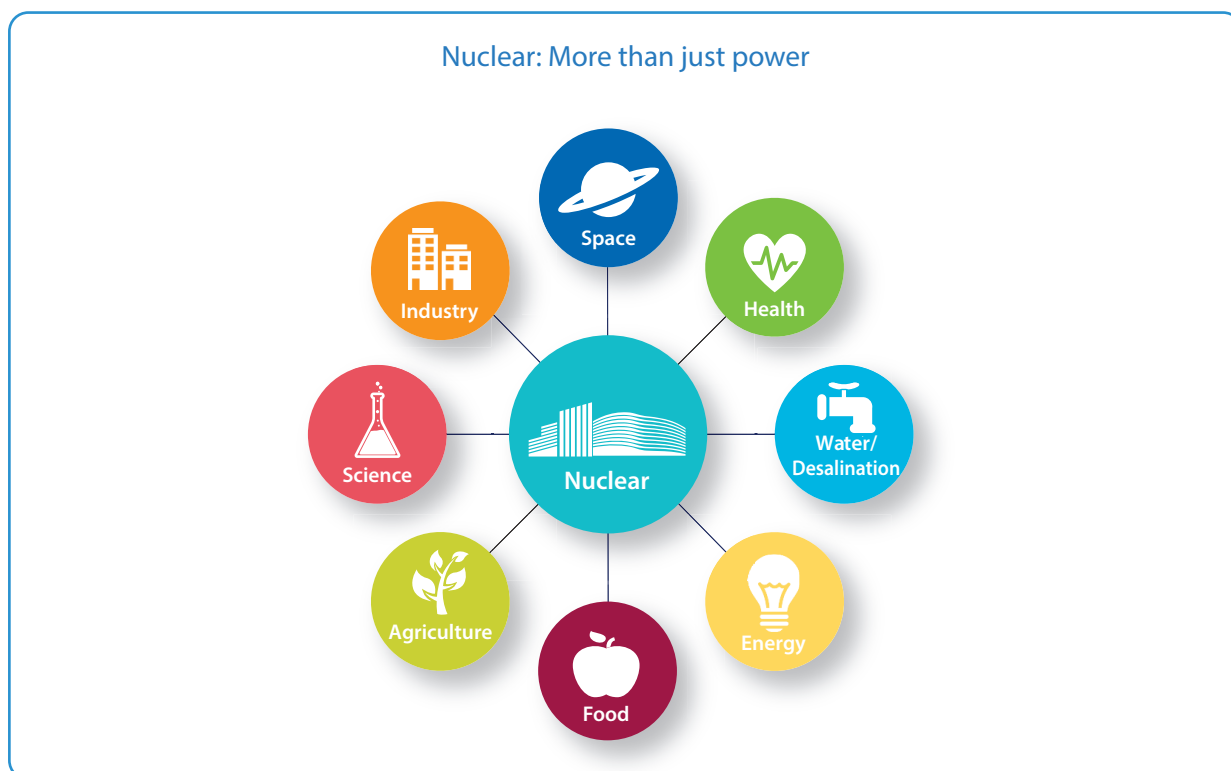
The value of nuclear:

Society is facing significant challenges in terms of climate change, access to affordable energy, health and employment. The European nuclear sector stands ready to meet these challenges.

Climate change is a major global threat which is addressed by the Paris Agreement target of limiting global warming to 1.5 °C above pre-industrial levels. In line with the Paris Agreement, the EU aims to become a climate champion by being climate-neutral by 2050. To achieve these targets, the Intergovernmental Panel on Climate Change, International Energy Agency and European Commission reaffirmed that nuclear is a low-carbon source of energy which will be essential alongside renewables.


Access to energy is key to our day to day lives. Citizens and industry need access to energy 24/7. Electricity demand is set to increase from 3000TWh to 4808TWh by 2050¹ due to increased electrification. Nuclear provides both flexible and dispatchable electricity, generating large quantities of low-carbon energy 24/7 without the need for other backup sources of energy nor large-scale storage. As a result, nuclear is capable of meeting the expected increase in demand for low-carbon energy thereby ensuring that, on the one hand, society will have access to the energy it needs when it needs it and, on the other, that the EU is capable of meeting its decarbonisation targets. Amid the outbreak of COVID-19 in Europe, the European nuclear industry proved its resilience in times of crisis by continuing to provide Europeans and industry with a stable and secure supply of low-carbon electricity.

Affordable energy is becoming an increasing problem. More and more citizens are facing energy poverty, and European industries are struggling to maintain their competitiveness. In the context of the EU's decarbonisation strategy, nuclear protects consumers and energy intensive industries due to its affordability. For example, it is not affected by the increase in the price of CO2 linked with the revision of the EU Emissions Trading System.



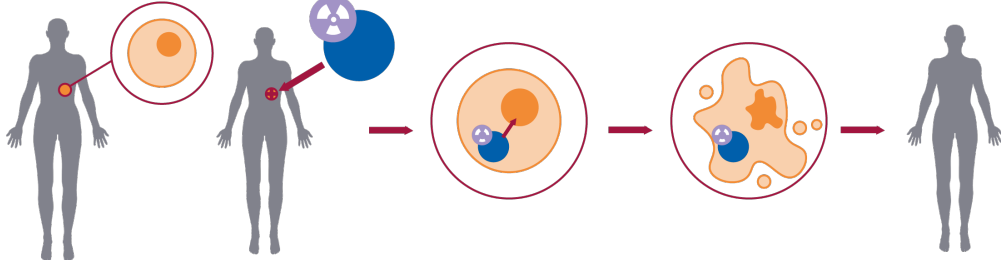
¹ [In-depth analysis in support of the Commission communication, A Clean Planet for all. A European long-term strategic vision for a prosperous, modern, competitive and climate neutral economy](#), European Commission, 2018

Health Thanks to nuclear applications, Europe’s citizens have access to life saving treatments and diagnostic technologies. Every year, 9 million patients in Europe benefit from nuclear medicine in the diagnosis and treatment of illness such as cancer, cardiovascular and neurological disorders². In addition, the European nuclear industry, including research facilities, is a leading supplier of radioisotopes, helping 30 million patients worldwide every year. The decrease in the number of skilled people coming into the nuclear field could eventually have an impact on the production of radioisotopes and thus cancer treatment:



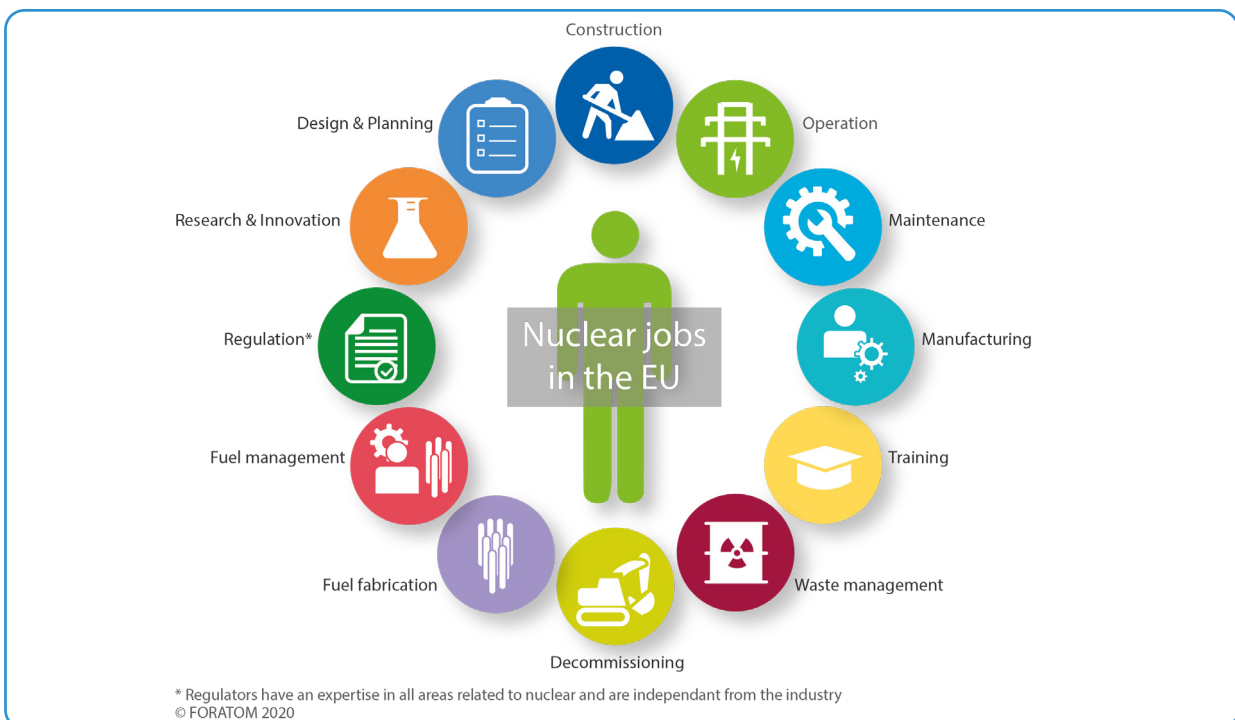
Radioisotopes
Radioisotopes - a radioactive form of elements, with unstable nuclei, which undergo radioactive decay to stable forms, emitting characteristic alpha, beta, or gamma radiation - are used frequently in medicine for diagnostic (identification) and therapeutic (treatment) purposes.

Treatment of cancer
The radioisotope is attached to a carrier molecule, which becomes a therapeutic radiopharmaceutical. It targets the tumour after being administered to the patient. Once the molecule is attached to the cancerous cell, the radioisotope irradiates it and eventually kills the tumour by disrupting its DNA.
Such a targeted approach has a clear benefit over external radiotherapy (irradiation) as it limits the damage to healthy tissue around the tumour.



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Jobs and employment are a major concern for many people in Europe, in particular those living in CO2 intensive regions which will be most affected by the transition to a low carbon economy. The nuclear sector – with its European based supply chain – offers a wide ecosystem of jobs at different levels, all requiring specific competences. Currently, the nuclear sector is working towards attracting new talents and retaining its current workforce. Indeed, ensuring that it has a skilled workforce is essential to its survival as well as to maintaining the societal benefits nuclear provides. Furthermore, the high-value skills developed in the nuclear sector are multidisciplinary in nature and to some extent interchangeable between different areas of the industry.



² European Commission, European Observatory on the Supply of medical Radioisotopes, https://ec.europa.eu/euratom/observatory_radioisotopes.html

Actions to be undertaken by industry

The European nuclear sector as a whole is facing a skills shortage. Indeed, the workforce which was involved in the construction of the initial fleet – including research reactors – and its first operation is reaching retirement age and thus has to be replaced, embracing state of the art knowledge and skills. This is the case not only for the nuclear energy industry, but also for other nuclear applications – eg medical, research and innovation.

Industry, research institutes and universities are all facing the same problem. This is due to the fact that there are fewer secondary students choosing STEM subjects in higher education. This problem is further amplified by the lack of positive political support for important nuclear technologies, which has an impact on the number of young people interested in studying nuclear subjects.

In addition, adapting to digitalisation and automatization (which are important skill shifts for the decommissioning sector, as well as for new build) will be a challenge faced by the industry. This will require the reskilling and upskilling of workers, as well as ensuring an adequate transfer of knowledge between generations through apprenticeship schemes for instance. By tackling this challenge head on, the industry will be able to maintain its highly skilled workforce. To achieve this, there are a series of actions which the industry will need to undertake:

- Invest in and maintain human capital by working closely with local and national governments and other stakeholders, like the ENS Young Generation Network to render the industry more attractive to young people. This is especially important as more than 50%³ of the current workforce will have retired by 2040.
- Ensure a closer collaboration with research institutes and universities to attract more people into the nuclear field while making sure that they have the right skills. This could be done through a closer cooperation with the European Nuclear Education Network and the European Commission's Joint Research Center.
- Assess the different types of skills – and size of the workforce – which it will need over the next 30 years. This will be done by the industry in close collaboration with the European Human Resources Observatory for Nuclear Energy.
- Enhance innovation in the decommissioning sector: for example, through the integration of robotics and digitalisation. This will maintain the necessary workforce and skills needed to handle the end of life of nuclear plants.
- Promote the potential of innovation, research and development with the goal of attracting talented young professionals in highly innovative initiatives, such as the MYRRHA (Multi-purpose HYbrid Research Reactor for High-tech Applications) project, ITER or the development of small modular reactors.



³ Eriksen, B., Christiansen, B., Chenel Ramos, C., Van Kalleveen, A., Hirte, B., [Results of surveys of the Supply of and Demand for Nuclear Experts within the EU-28 Civil Nuclear Energy Sector](#), EUR 30014 EN, Publications Office of the European Union, Luxembourg, 2019; ISBN 978-92-76-14173-0, doi:10.2760/499847, JRC 117806

Policy recommendations

Policymakers at both EU and Member State level also need to play their part.

Nuclear clearly provides a broad range of benefits, including low-carbon energy and vital medical diagnosis and treatment. Nevertheless, some national policies tend to suggest that there is no future for nuclear in the EU, thus discouraging young people from joining the nuclear field. This trend must be reversed, with EU policies speaking more positively on nuclear. This will help ensure that the EU has a sufficient number of people coming into the field in order to continue its nuclear activities.

The industry therefore recommends the following:

- Promoting and making STEM subjects attractive amongst pupils to ensure European technological leadership.
- Developing and implementing policies which encourage young people to study and work in the nuclear field, by speaking more positively about the benefits which nuclear provides to society.
- Basing policies on robust scientific facts. This means ensuring that all technologies are treated on an equal footing and that accurate information is provided on employment opportunities **within the EU** in relation to the different low-carbon sectors.
- EU funds allocated to nuclear education and training should be increased. This will help ensure that the EU maintains its nuclear innovation leadership, by supporting a skilled workforce capable of both undertaking vital R&D as well as implementing innovative projects.
- Apply a long-term approach to EU funded projects in the field of Education & Training. Whilst projects which run for only a limited time do have some short-term benefits, much more could be achieved if they were to continue for a longer period. This may also encourage coordination between overlapping projects, and reduce the current duplication.
- Policymakers, educational systems and industry should work together to ensure generation transition and competence transfer, as well as to help the workforce adapt to new technologies (digitalisation, industry 4.0).

About us

The European Atomic Forum (FORATOM) is the Brussels-based trade association for the nuclear energy industry in Europe. The membership of FORATOM is made up of 15 national nuclear associations and through these associations, FORATOM represents nearly 3,000 European companies working in the industry and supporting around 1.1 million jobs.



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