

# ENEN+: ATTRACTING, DEVELOPING AND RETAINING NEW TALENTS TO CAREERS IN THE NUCLEAR FIELDS

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The ENEN+ project aims at reviving the interest of young generations in the nuclear sector. Accordingly, its main objectives are to attract new talents to careers in nuclear and to develop them beyond academic curricula. It is also crucial to increase the retention of the attracted talents in nuclear careers and to involve the nuclear stakeholders within the EU and beyond. Another purpose is to sustain the interest of young generations for nuclear professions in order to make sure that the project successfully contributes to the revival of interest in nuclear disciplines. The most important nuclear fields of the project are nuclear reactor engineering and safety, waste management and geological disposal and radiation protection and medical applications.

## 1 Introduction

The European Nuclear Education Network (ENEN) is an international non-profit organization (aisbl) established under the Belgian law. The main purpose of the ENEN Association is the preservation and further development of expertise in the nuclear fields through supporting and organizing higher education and training in Europe. Following a tradition of more than 17 years, the main objective of ENEN can be realized through the co-operation between universities, research organizations, regulatory bodies, the nuclear industry and any other organizations involved in the application of nuclear science and ionising radiation.

Nuclear technologies today exhibit unparalleled levels of safety and reliability. This has been made possible through considerable and long-term efforts of the excellently educated and trained employees with outstanding safety culture in the industry, competent regulatory authorities, research, higher education and technical support communities worldwide.

Early warning signs have started to emerge in the 90s in various European countries underlining the possible shortage of human resources and requirements for replacement of qualified nuclear personnel. The retirement of ageing workers, the lack of anticipation for preparing new generations of skilled workforce, negative public perception of nuclear and the lack of interest of young people to enter nuclear careers have been recognized as major difficulties encountered in just about all nuclear disciplines. This situation may give rise to the loss of nuclear knowledge, which might have already contributed to the reduced competitiveness of EU nuclear industry and could, in the future, also contribute to reduced safety and security of nuclear activities and installations.

## 2 The aim of the ENEN+ project

The lack of new talents electing nuclear careers is closely linked to an early loss of interest in nuclear sciences and insufficient information about the nuclear careers available to both secondary school pupils and university students entering the Bachelor, Master of Science and PhD levels.

The primary motivation of the ENEN+ project is to substantially contribute to the revival of the interest of young generations in careers in the nuclear sector. This is to be achieved by pursuing the following main objectives:

- Attract new talents to careers in nuclear.
- Develop the attracted talents beyond academic curricula.
- Increase the retention of attracted talents in nuclear careers.
- Involve the nuclear stakeholders within the EU and beyond.
- Sustain the revived interest for nuclear careers.

The ENEN+ consortium will focus on the learners and careers in the following nuclear disciplines:

- Nuclear reactor engineering and safety,
- Waste management and geological disposal,
- Radiation protection and
- Medical applications.

For the ENEN+ project it is imperative to provide activities focused on the three main target groups of potential talents:

- Secondary school pupils. Attractive basic information on careers in nuclear has been developed, made available in national languages and complemented with an EU wide competition of pupils. Summer camps are organized. Electronic tools, including social media, are used.
- Bachelor students. Most of the nuclear academic curricula within the ENEN association concentrate on master students. The existing efforts to attract bachelor students to pursue master education in nuclear will be strengthened by increasing the level of academic preparation for bachelor students. This may involve the reform of the pedagogy and culture of teaching in order to create exciting and engaging learning experiences, including opportunities for individual guidance towards nuclear careers and opportunities to interact with practitioners of nuclear.
- Young professionals after graduation. The nuclearization of graduates of non-nuclear sciences and technologies has been a considerable source of the nuclear talent throughout the nuclear era. Attracting more graduates to nuclearization may require strong support from the end-user and will be put in place through attractive e-information and opportunities for individual guidance towards nuclear careers coupled with opportunities to interact with practitioners of nuclear.

## 3 The activities of the ENEN+ project

Several different events have already been organised within the frames of the ENEN+ project. ENEN+ project organized the First European Nuclear Competition for Secondary School Pupils during 2019 as part of its project to revive the interest of young generations in the nuclear sector. Teams had to have two pupil members and one teacher. The task of the participants was to compose a 3-minute video on one or more of the four nuclear disciplines. The fifteen winner teams travelled to Budapest, Hungary on 1-5 July 2019 where they presented their project live at the First European Nuclear Competition and Summer School (Figure 1.). The Nuclear Competition for Secondary School Pupils will be organized online in 2021; webpage: <http://nuclearcompetition.enen.bme.hu/>



Figure 1. The participants of the First European Nuclear Competition and ENEN Science Camp

The BSc Summer Schools are specifically organised for undergraduate students. More than 70 BSc students applied for the first ENEN BSc Summer School and 45 BSc students participated from ten European countries in 2019 (Italy, Spain, Lithuania, Malta, Poland, Ukraine, Serbia, Russia, Romania and Hungary). During the Summer School, various programmes provided the students with the opportunity to obtain practical information while attending a memorable social event. Interesting lectures were given on all the nuclear fields and each nuclear profession was introduced in detail. The students could visit nuclear facilities, for example; research centres, nuclear power plants and medical facilities. Practical activities were performed in nuclear labs and training centres as well. The ENEN BSc Summer School will be organized online in 2021. webpage: <https://summerschool2020.enen.bme.hu/registration/>

Another yearly event is the ENEN PhD Event & Prize, which supports young researchers and scientists, who can present their research work and compete in a professional environment. Up to 12 PhD presentations are nominated by ENEN Members and selected by the ENEN PhD Prize Jury. The ENEN Association supports travel expenses as well as registration fee of the conference for the finalists; however, last year the competition was held online, in the framework of the NESTet 2020 Virtual Conference, in Brussels, Belgium. For the 3 ENEN PhD prizes, ENEN Association grants 1000€ to the winners in order to cover the expenses of attending an international conference and presenting the result of their research work.



Figure 2. The participants of the ENEN PhD Event & Prize in 2020.

The possibility to organise the PhD Event& Prize action in 2021 will depend on the evolution of the COVID-19 pandemic.

The ENEN+ project focuses on supporting students interested in nuclear reactor engineering and safety, waste management and geological disposal, radiation protection and medical applications. The integration of further nuclear disciplines and sustainability of the ENEN+ accomplishments beyond the project life will be given due attention. Career guidance with mobility support exceeding 1.000.000 EUR is envisioned.

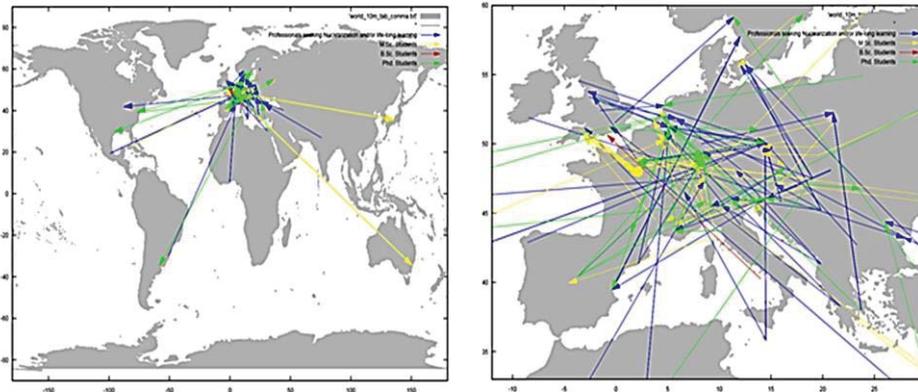


Figure 3. The ENEN+ activities in Europe (right side) and in the world (left side).

## 4 Conclusion

The ENEN+ project proposes cost-effective actions to attract, develop and retain new talents in nuclear professions. The project aims to reach out to secondary school pupils, students at various stages of the nuclear higher education, postdocs and candidates for nuclearization.

This project is a contribution of the ENEN Association, supported by the European Commission, to the common strategic objective of all nuclear stakeholders: to preserve, maintain and further develop the valuable nuclear knowledge for present and future generations.

## Acknowledgement

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## References

- [1] Grant Agreement number — 755576 — ENENplus — NFRP-2016-2017/NFRP-2016-2017-1. European Commission. Directorate-General Research & Innovation.
- [2] European Commission, ENENplus - Attract, Retain and Develop New Nuclear Talents Beyond Academic Curricula, [https://cordis.europa.eu/project/rcn/211046\\_en.html](https://cordis.europa.eu/project/rcn/211046_en.html), 2018
- [3] Web page for the ENENplus <https://plus.enen.eu/>