

# THE FINAL RESULT OF THE INTELLECTUAL WORK

ATTRACTIVENESS OF THE INFORMATIC  
AND ELECTRIC PROFESSIONS OF THE  
FUTURE AND RELEVANCE OF VET  
EDUCATION IN THE CONTEXT OF EU  
CHALLENGES - A STUDY WITH  
CONCLUSIONS AND RECOMMENDATIONS  
FOR THE ADAPTATION AND  
INTEGRATION OF LEARNED  
EXPERIENCES, SOLUTIONS, AND GOOD  
PRACTICES ON THE EXAMPLES OF  
GERMANY, GREECE AND POLAND



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THE EXCHANGE OF EXPERIENCE IN VET TRAINING IN INFORMATION  
TECHNOLOGY AND ELECTRICIAN PROFESSIONS".

### **The final result of the intellectual work**

**Attractiveness of the INFORMATIC and ELECTRIC professions  
of the future and relevance of VET education in the context of EU  
challenges – A study with conclusions and recommendations for the  
adaptation and integration of learned experiences, solutions, and  
good practices on the examples of Germany, Greece and Poland.**

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**FAV Service gGmbH GOTHA (DE)**



Ostroleka, 2024

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Ostroleka, 2024

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## About the project

The project was implemented by an international partnership in the framework of the project 'PARTNERSHIP FOR DIGITAL TRANSFORMATION – EXCHANGING EXPERIENCE IN THE DIRECTION OF VET TRAINING FOR THE FUTURE – INFORMATICIAN AND ELECTRICIAN', consisting of:

Leader:

- Adam Chętnik Scientific Society of Ostrołęka – Poland

Partners:

- FAV Service gGmbH – Germany,
- EKPEDEFTIKI PAREMVASI KDVM S.A. – Greece.

The partners' action responds to the challenge of equipping skilled workers with specific skills related to minimising energy consumption (e.g. SmatHOME, passive buildings), striving for '0' emissions. These professions require continuous development in new areas: photovoltaics, wind farms, heat pumps.

Nuclear power, smart technology, Industry 4.0 (remote information and energy management, design, industrial robotics, cyber security), resilience to a turbulent environment.

VET education should provide the aforementioned professions with the above-mentioned skills, without which transformations cannot be realised. A horizontal problem is the need to increase the number of trainees in electrician and IT training. The problem of energy transformation is the shortage of specialists (<https://strefabiznesu.pl/>). Policies in Poland, Germany and Greece assume an acceleration in energy neutrality with an even greater need for specialists in the above-mentioned professions (<https://www.euractiv.pl>), which provide sustainable jobs in the European labour market.

Project objectives:

- learning about how to make the professions of the future more attractive and the relevance of VET in the context of EU challenges through the exchange of experience,
- creation of a forum for cooperation and exchange of innovative practices and experiences on how to target and adapt VET, good

practices from the point of view of digital and energy transition and incorporate the learned solutions into everyday practice,

- Mutual learning of cross-sectoral cooperation increases the link between the education and employment phases and the inclusion of people with fewer opportunities.

Assumed project outcomes:

- learning about and comparing PL, GR, and DE solutions in VET education for the adopted professions, good practices oriented to the needs of the labour market in the context of transformation,
- to establish sustainable project cooperation between partners aimed at joint development of solutions with an EU dimension,
- sharing the experience in their environment.

The objectives adopted in the project are related to the chosen priority, "VET", as there is a need to exchange experiences in extent:

- a stronger link between VET education and the needs of the labour market,
- Orienting VET education towards the professions of the future,
- employability of young people.

The implementation of the project will take place through thematic project meetings of the partner organisations' expert teams at each partner organisation.

During each meeting, the expert teams will learn about:

- national approaches to providing professionals in the IT and electrical professions with specific skills as a prerequisite for realising the digital and energy transition,
- ways of enhancing the attractiveness of VET education at ISCED 3-4 level in the context of EU policy needs,
- planning needs in VET education in the IT and electrical professions,
- inclusion of people with fewer opportunities in VET education,
- good practice in terms of targeting and how to prepare members for the digital and energy transition.

## Introduction

The EU's current horizontal policy is geared towards a 'European Green Deal for the European Union and its citizens'. The idea is a new strategy for growth that aims to transform the EU into a fair and prosperous society living in a modern, resource-efficient and competitive economy with zero net greenhouse gas emissions in 2050 and where economic growth is decoupled from the use of natural resources. In the Commission Communication 'A European Green Deal' of 11.12.2019, in para. 4 'Time to act – together: a European Climate Pact' states.

"The Commission will work on capacity building to facilitate bottom-up initiatives on climate change and environmental protection. Information, guidance, and educational modules could help students exchange good practices. The Commission will ensure that the green transition is an important part of the debate on Europe's future"

<https://eur-lex.europa.eu/legal-content/PL/TXT/HTML/?uri=CELEX:52019DC0640> accessed 19.03.2024).

Reference to education is made in p.para. 2.2.4. "Boosting education and training" with the content "Proactive skills changes and upgrading are needed to reap the benefits of ecological transformation. The proposed European Social Fund will play an important role in supporting European workers in acquiring the skills they need to move successfully from declining to growing sectors and adapt to new processes. The Skills Agenda and the Youth Guarantee will be updated to enhance employability in the green economy." A key tool to support transformation is the „Fund for Equitable Transformation" established by REGULATION (EU) 2021/1056 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 24 June 2021 establishing the Fund for Equitable Transformation.

<https://eur-lex.europa.eu/legal-content/PL/TXT/HTML/?uri=CELEX:32021R1056> accessed 19.03.2024)

Its main objectives are to mitigate the effects of transformation by financing the diversification and modernisation of the local economy and mitigating negative effects on employment. To achieve its objectives, the



Fund supports investments in areas such as digital connectivity, clean energy technologies, emission reductions, industrial site regeneration, and workforce retraining.

An important element of EU policy is to integrate education into the transformation process in line with the , "Recommendation on learning for ecological transformation and sustainable development" adopted in June 2022 by the Council of the European Union.

[https://eur-lex.europa.eu/legal-content/PL/TXT/HTML/?uri=CELEX:32022H0627\(01\)](https://eur-lex.europa.eu/legal-content/PL/TXT/HTML/?uri=CELEX:32022H0627(01)) accessed 19.03.2024)

Among other things, the recommendations point to the need for cooperation and exchange of experience through:

(a) a strategic framework for European cooperation in education and training for the wider European education area (2021-2030), in which education and training for environmental transformation is one of the key priority areas,

(d) identifying examples of good practice, recording and sharing them, including through existing online platforms, and supporting the networking of national and other organisations working in the field of education, ecological transformation and environmental sustainability in formal and non-formal education and training.

The EU Council adopted a recommendation to stimulate learning for green transformation and sustainable development by, among other things:

- establishing science for green transformation and sustainable development as one of the priority areas of education and training policies and programmes,
- providing learning opportunities in formal, non-formal and informal settings,
- supporting and improving teaching and learning in the field of green transformation and sustainable development by providing infrastructure, tools and digital resources and building, in particular,

the new European Competence Framework for Sustainable Development (Green Competence).

EU Ministers (Press Release 16.06.2022) adopted a recommendation to Member States to stimulate and support policies and programmes on learning for green transformation and sustainable development.

[https://www.consilium.europa.eu/en/press/press-releases/2022/06/16/council-adopts-recommendation-to-stimulate-learning-for-the-green-transition/?utm\\_source=dsms-auto&utm\\_medium=email&utm\\_campaign=Council+adopts+recommendation+to+stimulate+learning+for+the+green+transition+and+sustainable+development](https://www.consilium.europa.eu/en/press/press-releases/2022/06/16/council-adopts-recommendation-to-stimulate-learning-for-the-green-transition/?utm_source=dsms-auto&utm_medium=email&utm_campaign=Council+adopts+recommendation+to+stimulate+learning+for+the+green+transition+and+sustainable+development) accessed 19.03.2024)

The idea behind the above-mentioned actions at the EU level is to acquire the skills needed for a changing labour market and to take action towards a sustainable future. Thus, the general idea of a 'Green Deal' has been dissected in various areas, including education and training. Given the autonomy of national education systems, including VET at the EU level, documents have been adopted that are not harmonising but in the nature of recommendations or communications. The EP Resolution "On modernising education in the EU" (2017/2224(INI)) in para. 50 indicates that a significant number of new jobs are being created in sectors related to renewable energy and that green sectors and professions should be adequately included in school curricula. Also, the COUNCIL RECOMMENDATION on Vocational Education and Training for Sustainable Competitiveness, Social Justice and Resilience (24.11.2020) refers to para. (4) and (5) on the importance of vocational education for the future and the achievement of EU goals:

(4) Efficient vocational education and training policies are fundamental to achieving the objective enshrined in Article 145 TFEU of promoting a high level of qualification and training of workers and their ability to adapt, and labour markets responsive to economic change,

(5) The Commission Communication 'A European Green Deal. "The European Green Deal" is a new European growth strategy that aims to transform Europe's economy and society and put them on a more

sustainable path. Schools, training institutions, and universities are the right actors to engage students, parents, businesses, and the wider community in the changes needed for a successful transformation. Proactive up-skilling and re-skilling are necessary components to reap the benefits of environmental transformation.

[\(https://eur-lex.europa.eu/legal-content/PL/ALL/?uri=CELEX:32020H1202\(01\)](https://eur-lex.europa.eu/legal-content/PL/ALL/?uri=CELEX:32020H1202(01)) accessed 19.03.2024).

In summary, the Green Deal has many dimensions. The ideal goal is to achieve energy neutrality for the EU area in 2050. The interim step is to reduce EU emissions by at least 55% by 2030. The achievement of climate targets is dissected in the Ready for 55 Package in the following areas:

- EU Emissions Trading Scheme (EU ETS),
- Emissions from maritime transport,
- Buildings, road transport and additional sectors,
- Emissions from air transport,
- Border carbon tax,
- Social Climate Fund.

[\(https://www.consilium.europa.eu/pl/press/press-releases/2023/04/25/fit-for-55-council-adopts-key-pieces-of-legislation-delivering-on-2030-climate-targets/](https://www.consilium.europa.eu/pl/press/press-releases/2023/04/25/fit-for-55-council-adopts-key-pieces-of-legislation-delivering-on-2030-climate-targets/) accessed 19.03.2024).

It can, therefore, be assumed that there will be revolutionary changes in each area, which will require new skills and qualifications appropriate to the transformations taking place. It will be in line with the EP Resolution "On the modernisation of education in the EU" related to green sectors and professions, green competencies or the acquisition of skills so as to move effectively from declining to growing sectors and to adapt to these new processes. Thus, VET education requires changes at all legal levels in order to achieve the expected changes corresponding to the EU climate policy.

With regard to the challenge of providing human resources for the modern economy, increasing the proportion of people with basic digital skills will be key. Digital education enables citizens to use new IT solutions to facilitate administrative procedures and entrepreneurs to acquire employees who are ready to operate in the new economic realities. Activities targeting modern digital technologies in the development processes of the regions are:

- development of economic innovation and information and communication technologies;
- increasing the digital availability, quality and efficiency of public services;
- building next-generation wireless networks;
- implementing smart city and smart village concepts using the latest technologies and open data;
- creating an information society by reducing digital exclusion and developing digital skills at every level.

All these activities require an adequate supply of workers in the IT, electrical and telecommunications professions. It is, therefore, a challenge for VET training at all levels to provide an adequate workforce for both the economic and public sectors. Thus, conditions need to be created to attract even more young people to train in the above-mentioned professions. To achieve this, good practices need to be identified and developed to be even more effective and enhance their universality and European dimension.

# **CHAPTER 1.**

## **A STUDY WITH CONCLUSIONS AND RECOMMENDATIONS FOR THE ADAPTATION AND INTEGRATION OF LEARNED EXPERIENCES OF SOLUTIONS, GOOD PRACTICES FROM THE TURING MARKET**

### **Introduction**

The way education works in Germany is due to the federal structure of the state. Competence and responsibility for the education system are divided between the federal government and the Länder. It is defined by the Basic Law (Grundgesetz). However, the administration of the education system from primary to higher education and adult education is almost exclusively the responsibility of the Länder.

Vocational education begins at the upper secondary level.

There are two pathways to gaining professional qualifications:

- training at a vocational upper secondary school (Berufsschule),
- dual system training.

Vocational training in the workplace is organised on the basis of federal regulations developed jointly by the state ministries of education, the bodies responsible for vocational education in the individual states, employers and trade unions.

Vocational school education is designed to impart knowledge general and theoretical vocational knowledge and includes lessons in general subjects and those intended for vocational subjects.

The importance of climate protection to the future is crucial. Every profession, regardless of the field in which it operates, has a responsibility to the environment and the future of generations. The building industry can make a positive contribution to climate protection through sustainable

practices, energy efficiency and reduction of greenhouse gas emissions. In addition, it can promote innovation and develop solutions To address the challenges of climate change.

In Germany, digitalisation is advanced in various sectors, including the economy, education, healthcare and administration. Companies are increasingly investing in digital technologies such as artificial intelligence, the Internet of Things and big data To be optimistic about their processes and offer innovative products and services. Digitisation is also influencing this work market by creating new field positions and transforming traditional activities. At the same time, there are discussions about data protection, cyber security, and the impact of digitisation on society.

The foundation of all research and development is the different regulations for this protection from climate and environment. Following this decision from the Federal Constitutional Court on 29 April 2021 and with respect to the climate European target for 2030, the Federal Government presented on 12 May 2021 a revised Climate Protection Act, which entered into force on 31 August 2021. This Climate Protection Act raises this Do reduction target for CO<sub>2</sub> emissions. The reduction target for 2030 increases by 10 per cent crossover to at least 65 per cent. This means that Germany will reduce its greenhouse gas emissions by 65 per cent by the end of this decade compared to 1990. The higher ambitions also affect CO<sub>2</sub> reduction targets for 2030 in individual sectors, such as energy, industry, transport, buildings and agriculture.

In addition, a number of new climate laws have been adopted in the EU. With a target of 'Fit for 55', members of the States aim to reduce internet greenhouse gas emissions by at least 55% by 2030. During the same period, the share of renewable energies in gross electricity consumption is to increase to at least 42.5%, and preferably 45%. Throughout Europe, there has also been a huge expansion of solar and wind energy. New and innovative designs and installation techniques will enable the transition from being a climate driver to becoming an environmentally friendly, socially compatible and economically viable sector.

## **1.1. Description of the approach to equipping professionals in the IT and electrical professions with specific skills**

The approach to developing specific skills for professionals in the IT and electrical professions is usually based on a combination of formal training, practical experience and ongoing professional development. Those who wish to pursue a career in these fields often start with a degree in computer science, electrical engineering or a related field, which provides them with a solid theoretical foundation. Specialisation then follows, with many organisations offering tailored training programmes that meet the specific needs of the IT and electrical industries. These programs cover topics such as software development, network administration, hardware installation and electrical systems.

Professional certifications such as CompTIA, Cisco or industry certifications such as Certified Electrician are key to proving skills and expertise in these professions. Employers value such certifications because they help professionals prove their competence in specific areas. With rapidly changing technologies and electrical systems, continuous learning is essential. Regular attendance at training programmes, workshops, seminars and online courses is essential to keep up to date with the latest developments and best practices.

Within the IT and electrical professions, professionals can specialise in different areas depending on their interests and career goals, including cyber security, data analytics, software development, renewable energy systems or telecommunications. We focus on a combination of education, practical experience, certification and continuous learning to meet the demands of these dynamic industries. Specific skills include knowledge of networked devices to create integrated smart home systems. Professionals must be able to implement robust security measures to protect user data and privacy. In addition, programming skills are required to customise and integrate smart home devices.

As the complexity of smart home systems increases, so does the need to identify and troubleshoot problems. Professionals must have strong

diagnostic skills to troubleshoot hardware and software issues. Interdisciplinary collaboration is also key, as smart home technologies combine different disciplines such as electrical engineering, computer science and data communications. Each employee should be able to work across disciplinary boundaries and collaborate with different teams.

Overall, today's developments in smart home technology require a wide range of skills from professionals in the IT and electrical professions to meet the demands of the ever-evolving technology. IT professionals are undergoing strong growth and constant change.

**Important trends include:**

- **The growing contribution of artificial intelligence (AI) and machine learning (ML)** to solving complex problems in areas such as healthcare, finance, and automotive.
- **The importance of cybersecurity is growing** as IT professionals develop critical security solutions to protect data and systems from attacks.
- **The ability to analyse large volumes of data** and derive valuable insights is crucial for many industries. IT professionals are using advanced analytics techniques to extract relevant information from large data sets.
- **The use of cloud-based platforms** is increasingly common, as companies seek to make their infrastructure more flexible. IT professionals are significantly involved in the development and management of cloud-based services.
- **With the increase in networking of devices and sensors**, new opportunities and challenges arise. IT professionals play a key role in the development of IoT solutions that promote automation and efficiency in various fields.
- **The ethical responsibility of IT professionals** is gaining importance as the discussion on ethical guidelines and responsible use of technology becomes more important. In general, the role of IT technicians requires constant training and adaptation to new



technologies and trends. The electronics technician profession has also changed significantly in recent years and will continue to do so.

**Important trends and developments include:**

- **The use of electronic engineers** in areas such as robotics, control and regulation technology, and industrial automation is driven by advances in digital technology and automation.
- **Installation, maintenance and repair of renewable energy equipment** such as solar systems and wind turbines.
- **Increasing demand for electronics technicians who are familiar** with the installation and maintenance of electric vehicle charging systems.
- **The increasing integration of electronics** in residential buildings to control lighting, heating, and security systems requires electronics technicians to install and maintain smart home systems.
- **There is a need to protect electronic systems and data from cyber attacks**, making it increasingly important to ensure the security and integrity of these systems. – Due to the shortage of skilled workers in some areas of the electronics industry, **further training and qualifications for electronics technicians** are becoming increasingly important to keep up with rapidly changing technologies.

Overall, the electronics technician profession continues to offer a wide range of possibilities and opportunities for skilled workers in sectors ranging from industry and construction to renewable energy and electromobility.

## **1.2. Description of how to promote and enhance the attractiveness of vocational education and training at ISCED levels 3-4 in the context of EU policy needs**

Changes in IT and electronics professions require the creation of new professions to meet the demands of the changing world of work. With increasing technologicalization in various industries, new fields of work are emerging that require specialised knowledge. For example, the profession of 'integration engineer', which is responsible for the seamless integration of electronic and IT systems, may emerge. In addition, professions in areas such as cyber security, artificial intelligence and renewable energies are needed to train professionals with in-depth knowledge in these specialised fields.

The increasing use of technology in companies is also leading to the need for professionals, such as 'technology consultants' or 'digitisation experts', who support companies in the selection and implementation of technology solutions. With the growing importance of sustainability, professions such as 'sustainability engineer' or 'green technology consultant' that focus on the development of sustainable technologies may emerge. In addition, interdisciplinary professions that combine technological knowledge with other fields, such as healthcare and education, may emerge.

**The EU has set various requirements for vocational training in its Member States in order to improve the quality and comparability of training programmes. These include:**

### **1. Quality standards:**

Minimum standards for vocational training to ensure that trainees acquire the necessary skills.

### **2. Mobility:**

Promoting the mobility of apprentices through programmes such as Erasmus+.

### **3. Recognition of qualifications:**

Mechanisms to facilitate the recognition of professional qualifications between Member States.

### **4. Collaboration:**

Sharing best practices to improve vocational training and meet labour market needs.

These measures aim to strengthen vocational education in the EU and increase the employability of citizens. Strategies such as early career guidance, partnerships with industry players and regular curriculum updates are needed to make vocational education and training more attractive. Integrating digital skills and green technology into training is also important.

Recognising and validating VET skills is crucial to their attractiveness. Dual education models that combine theoretical learning with practical training can make VET more attractive to students. In order to provide quality education, investment in infrastructure and resources is needed teaching resources .

In addition, public awareness campaigns need to be launched to break down stereotypes about vocational education and training and highlight the wide range of career opportunities. By implementing these strategies, policymakers can promote the attractiveness of VET and ensure that it meets the needs of the labour market, ultimately supporting this EU's economic growth and competitiveness

## **1.3. Describe best practices for guiding and preparing collaborating companies for digital and transformation**

Digital transformation encompasses several key areas that help companies optimise business processes and develop new business models. This includes adapting and automating core processes, using digital technologies to transform traditional business models and fostering an open corporate culture that supports the adoption of new technologies.

Another important aspect is the diversification of energy sources. Companies should switch to renewable energy sources to reduce dependence on fossil fuels while operating in a more environmentally friendly manner. Investing in energy efficiency and fostering innovation are also key to meeting market challenges.

In addition, employee qualifications are of paramount importance. Training and continuing education help prepare the workforce for the demands of digital transformation. Through cooperation with schools and educational institutions, companies can also inspire young talent into the areas of digitalisation and renewable energy.

The progress of transformation in the energy sector depends critically on the socio-economic sustainability of energy supply in economic stimulus programmes. Organisations can prepare for this transformation by implementing best practices:

- 1. Diversification of energy sources:** Switching to renewable energy sources, such as solar, wind and hydropower, reduces dependence on fossil fuels and mitigates impacts on the environment.
- 2. Investment in energy efficiency:** By using energy-efficient technologies and optimising processes, companies can reduce their energy consumption.
- 3. Promoting innovation and research:** Investments in research and development, as well as partnerships with research institutions, support the development of new technologies in the energy sector.
- 4. Adaptation to regulatory requirements:** Companies should familiarise themselves with current and future regulations and adapt their strategies accordingly to take into account environmental standards and emissions trading schemes.
- 5. Staff qualification and training:** Targeted training can prepare employees for the demands of the transition, particularly in the areas of renewable energy and sustainable practices.
- 6. Collaboration and partnerships:** Collaboration with other companies, governments, and civil society enables the exchange of resources and experiences to promote transformation jointly.

In addition, companies should actively visit schools and educational institutions to inspire students to pursue careers in digitalisation and renewable energy. Internships, company visits and practice-oriented training concepts offer students valuable insights. Providing mentors and continuous training are also important to ensure that trainees can keep up with the latest developments. Digital learning methods, such as e-learning platforms, are key to making training flexible and efficient.

By implementing these practices, companies can not only drive their own transformation in the energy sector but also help create a more sustainable energy future.

**Various best practices can be implemented to prepare for digital and energy transformation and to support collaborating companies:**

- 1. Business process transformation:** Automate and adapt existing core processes to increase efficiency and profitability, for example, through cloud-based systems in supply chain management.
- 2. Business model transformation:** Using digital technologies to transform traditional business models, such as the transition of the automotive industry to subscription models.
- 3. Organisational and cultural transformation:** Promoting an open corporate culture that supports the adoption of digital technologies, including communicating their benefits.
- 4. Use of innovative technologies:** Leverage modern ERP, AI, machine learning, IoT and robotics to increase efficiency and optimise business models and customer service.
- 5. Diversifying energy sources:** Switching to renewable energy such as solar and wind power to reduce dependence on fossil fuels and minimise environmental impact.
- 6. Investment in energy efficiency:** Implementing energy-efficient technologies to reduce energy consumption.
- 7. Promoting innovation and research:** Investment in research and development of new technologies in the energy sector.

8. **Alignment with regulatory requirements:** Compliance with environmental standards and integration of renewable energy sources into the business model.
9. **Staff qualification and training:** Employees will be trained in renewables, energy efficiency, and sustainable practices.
10. **Cooperation and partnerships:** Collaboration with other companies, governments, and civil society is needed to promote transformation in the energy sector.
11. **Educational initiatives:** Companies should visit schools to inform students about career opportunities in digitisation and renewables and provide practical experience through internships.
12. **Continuous training:** Support employees in training and attend conferences to keep abreast of current developments.
13. **Digital learning methods:** Using e-learning platforms and online courses for flexible and efficient training.

These practices enable companies to effectively address the challenges of digital and energy transformation and strengthen their competitiveness and sustainability.

#### **1.4. Description of how to plan VET training needs for IT and electrical professions**

##### **1. Analysis needed**

The planning of the demand for skilled workers in vocational education for computer scientists and electricians is carried out through various methods, in particular through needs analyses. These analyses take into account current industry trends and the labour market situation using surveys, expert interviews and data analysis. In Germany, the Vocational Training Act (BBiG) regulates the bodies responsible for vocational training, such as the Chambers of Crafts for craft trades and the Chambers of Industry and Commerce for non-craft trades. In Thuringia, the Training Department of the State Administrative Office is responsible for

vocational training in the public sector. The National Commission for Vocational Education and Training of Thuringia, which is assigned to the Ministry of Labour and Social Affairs, analyses vocational requirements. In 2022, around 75 per cent of employees subject to social security contributions in Thuringia will have a recognised vocational qualification, highlighting the importance of vocational training to ensure a skilled workforce. Various factors, including technological advances, demographic changes, and economic trends, influence vocational needs. In particular, digitalisation and automation are creating new occupational fields while traditional occupations are changing. In Thuringia, skilled workers are in demand in areas such as Industry 4.0, electromobility and renewable energies. At the same time, the demand for health and care professions is increasing due to the ageing population.

To meet the challenges of climate change, the demand for environmental and sustainability professionals is also growing. The COVID-19 pandemic has also influenced labour demand, increasing the need for health professionals and IT specialists. Geopolitical events also affect trade relations and demand for certain professions, reinforcing the need for specialists in international relations and security expertise.

Overall, it is crucial that Thuringia continuously adapts its education and training offerings to meet changing demands and ensure a competitive workforce situation.

## **2. Cooperation with companies**

In Thuringia, training needs are identified through partnerships with companies, taking into account their requirements for future employees. Companies collaborate at different levels to develop common training programmes and exchange content. This collaboration allows apprentices to learn a wider range of skills and better prepare themselves for the labour market. In addition, by pooling their resources, companies can reduce costs by making effective use of joint training workshops and teaching materials, which benefits both parties.

### **3. Competency profiles**

The definition of competency profiles for individual professions enables an accurate assessment of the skills and qualifications required of trainees. Studie\_Kompetenzentwicklung-ZUKUNFT-AUTOMOBIL-in-Thuringen.pdf (thaff-thuringen.de) Starting on p. 49, this study examines the adaptation of the competence profiles from the different occupations of the group in the automobile industry.

### **4. Forecasts**

Forecasts of the future demand for skilled workers in Thuringia depend on various factors, such as demographic changes, economic trends, technological developments and political decisions. Demand is expected to increase, especially in the healthcare sector, due to the ageing population. Digitalisation will further increase the demand for IT specialists, software developers and other digital specialists, especially in the electrical industry, where networked systems are becoming increasingly important.

Thuringia is establishing itself as a location for innovative technology companies, increasing the demand for skilled workers in areas such as software development, web development, data analytics, cyber security and cloud computing. Knowledge of artificial intelligence, machine learning and big data analytics is particularly in demand, as these technologies are key to competitive advantage and process optimisation. In addition, occupations in IT infrastructure, such as network technicians and system administrators, are becoming increasingly important as companies need to modernise their IT systems. Occupations in renewable energy and environmental protection are also becoming increasingly important as Thuringia focuses on sustainability. The COVID-19 pandemic could have a long-term impact on the labour market, and remote working and digital transformation could create new areas of work. In order to accurately forecast the demand for skilled workers, it is necessary to analyse data and consider different scenarios continuously. This requires close cooperation between the government, businesses and educational institutions.



Currently, 149,000 vacancies in Germany are unfilled in IT-related professions, with candidates with dual vocational training in IT specialists (44 per cent) having been recruited in the last twelve months.

## **Summary**

The approach to ensuring skilled workers in IT and electrical professions involves a combination of formal and practical training, professional development and certification. Training usually starts with a diploma in computer science or a

Electrical engineering is followed by specialised training programmes targeting industry skills such as software development, network administration, and equipment installation. Certifications from recognised bodies such as CompTIA and Cisco are key to validating these skills and are valued by employers. With the rapid advancement of technology, continuous learning is essential. Professionals can specialise in areas such as cyber security, renewable energy systems or telecommunications. In the smart home sector, skills such as networking devices, security measures, and programming are in demand. Computer scientists need to adapt to trends such as artificial intelligence and cloud computing, while electronics technicians are increasingly in demand in robotics, industrial automation and renewable energy.

Targeted measures Are required to increase the attractiveness of VET at ISCED 3-4 levels. This includes the creation of new professions, such as integration engineer or sustainable development engineer, which include the need for specific skills. The EU sets minimum quality standards for vocational education and training and promotes apprentice mobility through programmes such as Erasmus+. Early career guidance can attract young people into vocational education and training. Close cooperation with employers and chambers of commerce helps to align training programmes with the labour market. Curriculum updates are needed to integrate digital skills and green technologies. Dual education models that combine theory and practice make VET more attractive.

Investment in infrastructure and teaching resources is crucial for quality education. Public relations campaigns can help break down stereotypes about VET. By implementing these strategies, policymakers can make vocational education more attractive and more responsive to the needs of the labour market.

In Thuringia, the demand for skilled workers in IT and electrical engineering is determined by needs analyses, which include surveys and data analyses developed in cooperation with chambers. Through cooperation, companies can identify training needs and develop programmes that optimally prepare trainees for the labour market. Technological advances and geopolitical events are influencing the needs of professions, so it is necessary to adapt education and training programmes to ensure competitiveness.

## **CHAPTER 2.**

### **A STUDY WITH CONCLUSIONS AND RECOMMENDATIONS FOR THE ADAPTATION AND INCORPORATION OF LESSONS LEARNED, GOOD PRACTICES FROM THE GREEK MARKET**

#### **Introduction**

The formal structure of the educational pathway in Greece includes:

1. Early childhood education: Early childhood education is provided for children from 2 months to compulsory school starting age. Pre-school education is compulsory for all children from 4 years of age.
2. Primary education: A 6-year primary school covers children between the ages of 6 and 12. The Ministry of Education oversees the organisation and operation of pre-schools and primary schools.
3. Secondary education: this level comprises two cycles of study: the first cycle is compulsory and corresponds to the gymnasium (lower secondary school). It lasts 3 years and provides general education. Cycle II is optional, lasts 3 years and corresponds to a general or vocational school.
4. Higher education: this is the last level of the formal education system. Most undergraduate programmes last 4 years and are offered full-time. 5 Postgraduate programmes last 1 to 2 years, and doctoral programmes last at least 3 years and include:
  - University sector, i.e. Universities, Polytechnics, Academies of Fine Arts
  - Technical sector, i.e. technical colleges and the College of Education and Technology

The national body responsible for adult education is the General Secretariat for Vocational Education and Training, Continuing Education and Youth/Ministry of Education and Religious Affairs.

There are also a number of institutions that operate as public or private law entities, supervised by the Ministry of Education and Religious Affairs. These include:

Foundation for Youth and Lifelong Learning (INEDIVIM) or the National Organisation for the Certification of Professional Qualifications and Guidance (EOPPEP).

Governance and oversight of the education system is provided by:

- Ministry of Education and Religious Affairs as the central administrative body for all levels of education. It is tasked with setting the long-term goals of the Greek education system, developing curriculum content and managing the education budget,
- The education directorates oversee the implementation of the national education policy,
- The Directorates of Primary and Secondary Education oversee all schools in their area at the local level.

The growing demand for sustainable energy solutions, coupled with accelerating technological advances, highlights more than ever the need for skilled professionals in the IT and electrical sectors.

## **2.1 A description of the approach to providing professionals in the IT and electrical professions with specific Skills**

In this study, we will discuss how successful practices from the Greek market can be adapted and integrated into a broader European framework while analysing key areas, with the aim of improving vocational education and training (VET) in IT and electrical professions, aligning with EU policy objectives and supporting both digital and energy transformation. The main objective is to adapt the workforce to the demands of modern trends in the workplace, thereby enhancing their prospects and contributing to the modernisation of the Greek economy. Critical to

meeting this challenge is vocational training programmes, with these initiatives serving as catalysts for innovation, growth and sustainability. The Greek market, in this regard, has demonstrated a comprehensive and holistic approach to developing the necessary skills for these professions by:

- 1) Integration of industry-specific modules and practical training into vocational education and training programmes
  - Industry modules: Integration of specialised courses tailored to industry needs, including programming, network management and electrical systems.
  - Practical training: Providing students with practical experience through laboratories and real projects, bridging the gap between theory and practice.
- 2) Work with leading IT and electrical companies to offer internships, apprenticeships and on-the-job training.
  - Internships and work placements: Working with leading companies to provide on-the-job training for students, ensuring they gain practical experience and industry insight.
  - Mentoring programmes: Engaging industry professionals as mentors to guide students and enhance their educational experience.
- 3) Establishment of recognised certification schemes to validate the competence of professionals
  - Recognised certification programmes: Establish industry-recognised certifications that validate skills and competencies, making graduates more competitive in the job market
  - Continuous evaluation: Implement continuous evaluation and update of the certification standards to ensure that they are up to date.

4) Promote lifelong learning through advanced courses and professional development programmes to keep skills up to date with technological advances.

- Advanced courses and workshops: Offering continuing education opportunities to help professionals keep their skills up to date.

Professional development programmes: Facilitate continuous professional development through workshops, seminars and online courses.

### **Implementation of training programmes**

Innovative in both design and delivery, vocational training programmes are organised by the Vocational Training and Employment Centres (K.D.V.M), which act as learning 'hubs', combining traditional classroom teaching with state-of-the-art remote and distance learning methods to ensure accessibility without compromising quality. Participants are immersed in a transformative learning experience that transcends geographical boundaries and time constraints.

### **Application process and eligibility**

The democratisation of access to education lies at the heart of these initiatives, exemplified by the eligibility criteria, meticulously designed to be inclusive but demanding, ensuring that opportunities are extended to those most in need, often prioritising those registered on the unemployment registers of the Organisation of Manpower Employment (OAED), aged 18 and over and with a secondary school diploma, these programmes level the playing field, enabling all to achieve their career aspirations.

### **Voucher system**

At the heart of the programme's effectiveness is an innovative voucher system synonymous with empowerment and choice. Through a transparent and meritocratic selection process overseen by OAED, eligible participants receive training vouchers, giving them access to a range of subject areas and training providers. This democratisation of opportunity, coupled with a user-centric interface, heralds a new era of

personalised learning, where individuals are empowered to chart their own path to professional excellence.

### **Educational Supplement**

Recognition of achievement serves as the foundation for these initiatives, epitomised by the provision of an educational allowance upon successful completion and certification. Symbolising both recognition and investment in human capital, this allowance encourages excellence while recognising the dedication of participants. By aligning financial rewards with educational achievement, these programmes reinforce a culture of lifelong learning and continuous improvement, propelling individuals to higher levels of personal and professional fulfilment.

Promoting and increasing the attractiveness of vocational education and training at ISCED levels 3-4

Promoting VET and making it a viable option for students is key to the implementation of EU policy. Some of the approaches used in Greece include awareness campaigns on the benefits and career opportunities offered by VET in the fields of computer science and electrical engineering, but also career guidance through counselling services to help individuals understand the potential of VET pathways, as well as programmes providing financial incentives in the form of scholarships and financial assistance to break the economic gap among those choosing VET. All of the above are also matched with modern, state-of-the-art training facilities and equipment to provide a high-quality learning environment that reflects real-world conditions.

## **2.2 A description of how to promote and enhance the attractiveness of VET education at ISCED 3-4 level in the context of EU policy needs and good practice in orienting and preparing cooperating companies for the digital and energy transition**

One of the most effective ways to achieve this great leap forward in the IT and electrical professions is through effective collaboration between educational institutions, and the Greek market is using several key examples of joint development programmes where joint programme design ensures that the skills taught are directly relevant to modern industry needs. Another is the fostering of partnerships between academic institutions and companies on research and development projects, driving innovation and practical solutions to industry challenges, which also leads to Technology Adoption, encouraging companies to adopt the latest technologies and integrate them into training programmes, ensuring students are exposed to the latest tools and systems while establishing regular feedback loops between companies and training providers to continuously improve the curriculum and training methodologies based on industry trends and requirements.

In summary, Greek vocational training programmes represent a paradigm shift in workforce development. Programmes in the IT and electrical professions offer a solid combination of theoretical knowledge and practical experience. These programmes are characterised by strong links to industry, state-of-the-art facilities and comprehensive curricula that align with current industry needs. Harnessing the transformative power of education, these initiatives not only bridge the skills gap but also sow the seeds of innovation, prosperity and social equity through structured training, certification and educational supplements that develop individuals with competencies aligned with the changing needs of the labour market, supporting resilience and sustainable growth. This study delves into successful experiences and good practices from the Greek market, exploring how they can be adapted and integrated into the wider European Vocational Education and Training (VET) framework, analysing key thematic areas and providing examples of Greek



programmes to improve VET in IT and electrical professions, align with EU policy needs and support the ongoing digital and energy transformation.

Some of these programmes include:

**1) DYPA (Public Employment Service, formerly OAED), Workforce Employment Organisation (Οργανισμός Απασχόλησης Εργατικού Δυναμικού – OAED)**

- Overview: OAED provides vocational training programmes to enhance employability in various sectors, including IT and electrical engineering.
- Training programmes: These programmes include courses in IT, network administration and electrical installations. OAED's training centres are equipped with state-of-the-art equipment that simulates the real working environment.
- Employment support: OAED helps graduates find employment through job placement services and partnerships with companies.

Example programmes:

- Vocational training centres (KEK)
- IT programmes: Training in computer programming, network management and information systems.
- Electrical programmes: Courses for electrical technicians, electrical maintenance technicians and renewable energy technicians.
- Features: Emphasis on employability, cooperation with companies for on-the-job training and provision of job placement services.

**Comprehensive analysis of training programmes Δ.YII.A for economic recovery**

The Δ.YII.A initiative to offer workforce development training programmes under the Economic Recovery Fund is a strategic response to the changing needs of the labour market. Targeting 150,000 private sector workers, the programme aims to upgrade their skills, particularly in digital and 'green' areas, thereby increasing productivity and job retention.

### Programme components:

1. Theoretical training programmes: these 80-hour programmes focus on giving participants digital and 'green' skills, adapting to today's workplace demands.
2. Skills certification: Upon completion of the training, participants will receive a certificate confirming the knowledge and skills they have acquired.

### Innovations:

1. University partnerships: Public universities, in particular K.E.ΔI.BI.M., play a key role in the provision of training, offering participants access to high-quality educational resources.
2. Diverse training options: Unlike previous initiatives, the programme offers a wide range of training programmes, meeting the needs of high-demand sectors such as digital and 'green' skills.
3. Payment linked to results: The introduction of a payment-by-results method ensures that funds are only paid out upon successful certification, providing an incentive to increase the effectiveness of the programme.
4. Emphasis on international certification: Certification from reputable international technology companies adds credibility to the programme and is in line with industry standards.
5. Strict criteria for suppliers: More stringent requirements, including additional ISO certifications, ensure the quality of training provided by participating providers.
6. Independent review of materials: Ensuring the quality of educational materials through independent review enhances the effectiveness of the programme.
7. Participant choice: Allowing participants to choose their certification body increases the accessibility and flexibility of the programme.

Conclusions: The Δ.YII.A training programmes represent a significant advance in workforce development, addressing current skills gaps and

anticipating future industry needs. Utilising university partnerships, emphasising international certification and implementing performance-related payments, the programme ensures accountability and quality.

Recommendations:

1. Continuous evaluation: Implement robust monitoring and evaluation mechanisms to assess the impact of the programme and make necessary changes.
2. Adaptability: Maintaining flexibility to adapt to changing market requirements and technological advances.
3. Stakeholder engagement: Foster collaboration between the public and private sectors, academia and industry stakeholders to enhance the relevance and effectiveness of the programme.
4. Long-term sustainability: Develop a strategy to sustain the benefits of the programme beyond the initial funding period, possibly through public-private partnerships or integration into a national workforce development framework.

In summary, Δ.YII.A training programmes have great potential to drive economic recovery by equipping workers with the necessary skills. Through strategic partnerships and innovative approaches, the programme can catalyze long-term growth and competitiveness in the labour market.

### **Review of integrated training and employment measures for the unemployed**

The training and employment programme for unemployed 25 to 45-year-olds is a comprehensive intervention aimed at upgrading skills and retraining through Continuing Vocational Training (CVT) programmes, certification and short-term employment opportunities for people registered on the Digital Unemployment Register (DUR) aged 25 to 45. The objective of the action is to upgrade the skills and/or retraining of the target group of unemployed people aged 25 to 45 in high-demand sectors, with a focus on green and digital skills and their subsequent integration into the labour market upon completion of the CVT and certification programme. Specifically, the measure includes training and certification

of acquired knowledge and skills, followed by a six-month subsidised employment programme funded by the Public Investment Programme (PIP) to gain work experience. It should be noted that 19% of the funding allocated is to contribute to the acquisition of green skills and further promote the green economy. The Reconstruction and Resilience Fund finances the action on the basis of the decision to include the project entitled 'SUB1: Integrated training and employment activities for 15,000 unemployed persons aged 25 to 45 years – Action 16747' (OPAP code TA 5164476) in the Reconstruction and Resilience Fund (PSG4OH– HN5) as amended and in force -. The budget of the action (total public expenditure) after the decision to include it is EUR 49,731,600.00. It is expected that the following indicative objectives will be achieved through the implementation of the action:

1. Prevent and combat unemployment by improving the professional knowledge and skills of the unemployed and placing them in short-term subsidised employment upon completion of training and certification.
2. Increasing the employability of the unemployed.
3. Qualitative enhancement of the knowledge and skills of the unemployed through CVT programmes that respond to the modern demands of the production structure and economy.

## **2) SEPE – Training, certification and mentoring to strengthen the skills of unemployed young people aged 18-24 in ICT specialities**

The Special Service for the Implementation of the Operational Programme (SSIOP) – Employment and Social Economy Sector of the Ministry of Labour, Social Security and Social Solidarity, in cooperation with the Hellenic Association of Information and Communication Technologies (SEPE), is implementing the project 'SEPE – Training, certification and counselling to strengthen the skills of unemployed youth aged 18-24 in ICT specialities' (project code: 5007859). This initiative is part of the Operational Programme 'Human Resources Development, Education and Lifelong Learning' under the NSRF 2014-2020.

The project, with a budget of €7,860,000, is co-financed by Greece and the European Union (European Social Fund) under the Youth Employment Initiative. It aims to provide career guidance, training and certification to 3,000 unemployed and economically inactive young people aged between 18 and 24, focusing on ICT specialisations. The aim is to equip these individuals with the skills and knowledge necessary to integrate or reintegrate into the Greek labour market, particularly in the dynamic ICT sector.

### **Training specialisations**

Participants will receive training and certification in the following ICT specialisations:

1. Computer and network technician
2. Software Specialist
3. Specialist for web and mobile applications
4. Database programmer
5. IT security specialist

### **Comprehensive intervention package**

The project offers a comprehensive package of interventions that includes:

- Support and counselling services: Each participant will receive five individual counselling sessions.
- Theoretical training: 120-hour theoretical training programme.
- Practical training: 260-hour internship programme in relevant companies.
- Certification of qualifications: Certification of participants' skills based on recognised standards.

## **Phases of training**

The training programme, comprising 380 hours, is divided into the following stages:

- Phase A: 60 hours of theoretical training.
- Phase B: 100 hours of practical training.
- Phase C: 60 hours of theoretical training.
- Phase D: 160 hours of practical training.

Practical training will take place in enterprises related to the areas of training under real working conditions in the relevant regional unit where the training is conducted.

## **Certification standards**

Certification of participants' skills will be based on certification systems recognised by both the Greek and international labour markets. These certifications will be in accordance with ISO/IEC 17024 standards or will be issued by entities accredited by the National Organisation for the Certification of Qualifications and Professional Guidance (EOPPEP).

## **Eligibility criteria**

Unemployed young people interested in participating must meet the following criteria:

- Be between the ages of 18 and 24.
- Must be registered on the unemployment registers of the Organisation of Employment in the Workforce (OAED), regardless of whether they receive unemployment benefits.
- Have a compulsory, secondary, post-secondary or higher education.
- Must not be students or pupils of any educational institution.

## **Educational scholarship**

Participants will receive the following stipend:

- Theoretical training: €5.33 per hour, including insurance premiums and other deductions.
- Practical training: €3.20 per hour, including insurance premiums and other deductions.

The total stipend for the training is €1,471.60, including insurance premiums and other deductions.

## **Implementation in various regions**

The project will be implemented in all 13 regions of Greece, ensuring nationwide reach and impact.

## **Conclusions and recommendations**

The SEPE programme is an example of a structured and comprehensive approach to tackling youth unemployment by equipping young people with sought-after skills in the ICT sector. The successful implementation of such initiatives can serve as a model for similar programmes across Europe, highlighting the importance of targeted training, industry collaboration and continuous skills development to enhance employability in a changing labour market.

### **3) Upskilling and retraining programmes in high-demand sectors with a focus on digital and green skills**

The Ministry of Labour, in cooperation with the Continuing Vocational Training Centres (KEΔΙΒΙΜ) of Greek public universities, as well as accredited Continuing Vocational Training Centres (Κ.Δ.Β.Μ.) meeting certain quality assurance criteria, will provide training programmes to the unemployed registered in the Ministry of Labour's unemployment register. This effort is part of a national initiative to improve the skills of the workforce, particularly in digital and 'green' skills, in order to effectively

link them to the labour market and increase their employability while preserving future jobs.

This project aims to provide theoretical training services leading to the certification of knowledge and skills acquired during the training, aimed at beneficiaries aged 18 and over registered in the unemployment register of the Ministry of Labour.

In particular, the services provided under this project include:

1. Theoretical training programmes for unemployed beneficiaries lasting between 50 and 200 hours, leading to the acquisition of digital and "green" knowledge and skills, as described in each call for proposals.
2. Certification of knowledge and skills acquired through training programmes.

The action aims to provide theoretical training for 80,000 unemployed people over the age of 18, leading to digital and 'green' knowledge and skills, with appropriate certification by independent certification bodies. Providers must meet certain quality assurance criteria set out in public calls, and the training programmes of each register have a budget of €50 million.

Committees and eligible suppliers will evaluate proposals and will be invited to submit proposed training programmes.

The new generation of training programmes includes the following innovations:

- Universities play a central role in training: For the first time, unemployed citizens have access to training programmes offered by universities, in particular the Continuing Vocational Training Centres (KEΔIBIM) of public universities, under a special call aimed exclusively at public university institutions. In the first phase, universities will manage 50% of the budget.
- Wide range of options for modern training topics in high demand: Unlike previous programmes, which were mainly 'traditional' in



nature, beneficiaries can choose from a range of training programmes in high-demand sectors, with an emphasis on digital and 'green' skills.

- Payments to providers and beneficiaries linked to certification: 30% of the amount due to providers and trainees will only be paid after successful certification. For the first time, the Ministry of Labour is introducing a payment-for-results methodology to ensure efficiency and optimal use of the Recovery Fund.
- Emphasis on certification by major international technology companies providing recognised digital skills certifications through external providers. The aim is to increase the quality and attractiveness of the programmes.
- Raising the bar for training providers, with stricter participation criteria for continuing vocational training centres, including obtaining additional international ISO certification.
- Independent verification of educational materials by an independent body to ensure quality based on modern quality standards, verified by specialised independent bodies.
- The selection of certification bodies is done by the participants themselves rather than by the training providers, allowing beneficiaries to choose their preferred provider and certification body.
- Another innovation is that the register of programmes and the participation of the unemployed will remain 'open' until the budget is exhausted. In other words, beneficiaries can join the programme at any time and choose from a wide range of training programmes, which will be continuously enriched.

These new programmes mean modernising ongoing vocational training for the unemployed, with targeted interventions throughout the process and involving stakeholders such as training providers, certification bodies, trainees, etc. It provides:

- A wide range of training programmes (including programmes from major IT companies in high demand in the labour market) with quality-assured content.

- Free choice by the unemployed of the training programme, when they choose it, the training provider and the certification provider.
- Improving the quality of training providers by increasing the entry requirements for private continuing vocational training centres and the participation of continuing vocational training centres (ΚΕΔΙΒΙΜ) of public universities.

### **Sub-project 1: Implementation of vocational training programmes through a register of universities' continuing vocational training centres**

This sub-project involves the retraining and/or upgrading of digital and "green" skills for up to 40,000 unemployed people through the provision of professional training programmes of between 50 and 200 hours and certification of the knowledge and skills acquired. The sub-project will be implemented by providing training vouchers to beneficiaries who will be selected through a public invitation by the Ministry of Labour. The Ministry will issue a public invitation to specific groups of beneficiaries. A special register of vocational training providers will be established for this sub-project. All university continuing vocational training centres will be invited to participate in the public call based on specific quality criteria.

### **Sub-project 2: Analysis of the national production model and identification of specialisation and professional skills needs**

The sub-project is concerned with the retraining and/or upgrading of digital and "green" skills for up to 40,000 unemployed people through the provision of professional training programmes of between 50 and 200 hours and certification of the knowledge and skills acquired. The sub-project will be implemented by providing training vouchers to beneficiaries selected through a public call by the Ministry of Labour and Social Affairs. The Ministry will issue a public invitation to specific groups of beneficiaries. A special register of vocational training providers will be established for this sub-project. Licensed Vocational Training Centres (Κ.Δ.Β.Μ.) will be invited to participate in the Registry through a public invitation based on certain quality criteria.

#### **4) Expansion of the Digital Collection of Movable Monuments of the Ministry of Culture and Sports and construction of a new IT system for the National Archive of Monuments**

The enhancement of the digital collections of movable monuments managed by the Ministry of Culture and Sports and the development of a new information system for the National Archive of Antiquities is a transformative initiative to preserve Greece's cultural heritage. This study analyses the project's objectives, implementation, results and future recommendations to ensure the effective management and accessibility of these cultural assets. The project includes several key objectives to address existing gaps and improve the management of Greece's cultural heritage:

1. Enrichment of the National Archives of Historic Sites:
  - Documentation and digitisation: Systematic documentation and digitisation of some 500,000 movable artefacts, including some 340,000 museum artefacts and 160,000 movable artefacts held in regional service repositories. Many of these artefacts do not currently have adequate documentation and photographic records.
2. Expansion of digitisation infrastructure:
  - Digitisation stations: Establishment of new digitisation stations in the service units of the Ministry of Culture and Sports to ensure comprehensive coverage and facilitate the digitisation process throughout the country.
3. IT system update:
  - Modernisation: Upgrading the existing information system of the National Monuments Archive to use advanced technologies such as web applications and server consolidation.
  - Interoperability: Ensuring that the system is compatible with other heritage management systems, such as the Archaeological Cadastre, and incorporates updated data and metadata standards.

4. Integration of previously digitised monuments:
  - Consolidation: Integration of approximately 140,000 movable monuments digitised in previous projects and other digitised monuments into the new system, creating a unified digital repository.

### **Implementation strategies**

The project is being implemented in several phases, each aimed at ensuring systematic progress and comprehensive coverage:

1. Assessment and planning:
  - Initial assessment: Evaluation of existing documentation to identify gaps and areas of concern.
  - Detailed planning: Develop a comprehensive plan for the digitisation process, including resource allocation and scheduling.
2. Digitisation and documentation:
  - Implementation and training: Deployment of digitisation equipment and training of staff in regional services and museums.
  - Systematic capture: Documentation and digital capture of artefacts, including high-resolution imaging and metadata input.
3. System development and integration:
  - New system development: Development of a user-friendly information system with enhanced capabilities to effectively manage and access digitised data.
  - Data integration: Integration of previously digitised monuments into the new system, ensuring data consistency and completeness.

#### 4. Quality control and validation:

- Quality assurance: Implement quality control measures to ensure the accuracy and completeness of digitised data.
- Regular audits: Conduct regular audits and validation processes to maintain high standards.

The project has achieved several significant milestones, contributing to the preservation and accessibility of Greece's cultural heritage:

#### 1. Comprehensive documentation:

- Successfully documented and digitised a huge number of movable monuments, significantly enriching the National Archives of Antiquities.

#### 2. Improved accessibility:

- Increased access to digitised collections for researchers, scientists and the public through an improved, user-friendly information system.

#### 3. Technological progress:

- Adopt modern technologies and best practices in data management and systems interoperability, positioning the archive as a leader in digital heritage management.

#### 4. Consolidation of digital resources:

- Creation of a unified digital repository, integrating previously isolated datasets into a coherent and accessible resource.

### **5) Development of a User Network Support IT System for HEDNO S.A.**

This study analyses the initiative to develop a new Integrated Information System for the Hellenic Electricity Distribution Network Operator (HEDNO S.A.) within the framework of the Operational Programme 'Competitiveness, Entrepreneurship and Innovation'. The project, with

a budget of €20,000,714, aims to improve customer service, streamline internal processes and integrate various IT systems within the company. This analysis provides an in-depth look at the project objectives, implementation strategies, expected results and future recommendations.

The project aims to achieve several key objectives:

1. Installation and operation of the new integrated IT system:
  - Modernisation: Development of a state-of-the-art IT system to manage network user services and automate internal processes.
  - Adaptability: Ensure that the system can be adapted to changing business needs.
2. Development of an online services portal:
  - Customer service: Enabling one-stop customer service via an online portal, eliminating the need for physical visits to HEDNO units.
  - Efficiency: Streamlining the handling of consumer requests and improving the overall level of service provision.
3. Reorganisation of processes and functions:
  - Economies of scale: Achieve cost savings and process efficiencies through reorganisation.
  - Improved communication: Improved communication with users, suppliers and stakeholders.
4. Optimisation of meter data management:
  - Data integration: Improving the collection and management of data from low and medium voltage meters.
  - Real-time connectivity: Ensure real-time integration with future wholesale market systems and periodic settlement capabilities.

5. Performance and knowledge management:
  - Administrative information: Provide structured and coordinated management information to optimise performance and knowledge management.
6. Standardisation of processes:
  - Consistent application: Documentation and uniform application of work procedures throughout the company.

### **Implementation strategies**

The implementation of this project involves several stages to ensure comprehensive coverage and success:

1. Assessment and planning:
  - Initial review: Conduct a detailed assessment of existing systems and processes.
  - Strategic planning: Develop a strategic plan that sets out the stages of system development, portal creation, and process reorganisation.
2. System development and integration:
  - IT system: Design and develop a new integrated IT system with automation capabilities.
  - Web portal: Creation of a user-friendly web portal for customer service.
  - System integration: Ensure seamless integration with other HEDNO IT systems.
3. Testing and quality assurance:
  - Pilot testing: Conduct pilot tests to identify and resolve any issues.
  - Quality control: Implement robust quality control measures to ensure system reliability and usability.

#### 4. Implementation and training:

- System launch: Implementation of the new information system and web portal.
- Training programmes: Provide comprehensive training for HEDNO staff to ensure effective use and management of new systems.

The project aims to achieve several significant results:

##### 1. Improved customer service:

- Accessibility: Provide easy and comprehensive online access to services, increasing customer satisfaction.
- Efficiency: Streamlining the process of handling customer requests, reducing waiting times and improving service quality.

##### 2. Process efficiency and cost savings:

- Automated processes: Automation of internal processes to reduce manual work and operational costs.
- Economies of scale: Achieve significant cost savings through process reorganisation and efficiency improvements.

##### 3. Improved data management:

- Accurate data collection: Improving the accuracy and reliability of meter data collection and management.
- Real-time data: Enables real-time connectivity and data exchange with future market systems.

##### 4. Performance optimisation:

- Management information: Provide comprehensive and structured management information to support decision-making and optimise performance.
- Knowledge management: Improving knowledge management through structured information systems.



5. Standard procedures:

- Consistency: Ensure consistent application of procedures across the company, increasing operational uniformity and efficiency.

**6) Development of new web services to increase the functionality of the cadastre and to adapt the spatial information systems of EKXA S.A. to the INSPIRE directive.**

The initiative 'Development of new online services to increase the functionality of the cadastre and bring EKXA S.A.'s spatial information systems in line with the INSPIRE directive' represents a significant effort to modernise the Greek cadastral system. The project aims to improve the functionality and accessibility of the cadastre through new online services and to ensure compliance with the European INSPIRE Directive, which aims to establish a spatial data infrastructure for the European Union. This study provides a detailed analysis of the project's objectives, implementation, results and future recommendations.

The project includes several key objectives to make the cadastre more functional and accessible:

1. Development of new online services:

- Increased accessibility: Creation of new online services to improve access to cadastral information for both professionals and the public.
- Electronic transactions: Facilitate property transactions through electronic means, reducing the need for physical presence and paperwork.

2. Redesignation of NATURA sites:

- Environmental Protection: Reassessing and redefining the boundaries of NATURA 2000 sites in Greece in order to provide accurate and updated spatial data for these protected areas.

### 3. Compliance with the INSPIRE Directive:

- Data standardisation: Alignment of EKXA S.A.'s spatial data information systems with the standards and requirements set out in the INSPIRE Directive, promoting interoperability and data sharing across Europe.

Project implementation takes place in multiple phases to ensure thorough implementation and comprehensive coverage:

#### 1. Assessment and planning:

- Preliminary review: Conduct a detailed assessment of the current cadastre system and identify areas for improvement.
- Strategic planning: Development of a strategic plan outlining milestones for implementing new online services and bringing existing systems up to INSPIRE standards.

#### 2. Development and integration:

- Online services: Design and develop user-friendly online services for accessing cadastral information and conducting property transactions.
- Data Redelineation: Carry out a process of delineation of NATURA 2000 sites using updated spatial data and advanced mapping techniques.
- System Adaptation: Modify EKXA S.A. IT systems to comply with the requirements of the INSPIRE directive, ensuring data compatibility and interoperability.

#### 3. Testing and quality assurance:

- Pilot testing: Conduct pilot tests of new online services and adapted IT systems to identify and resolve any issues.
- Quality control: Implement robust quality control measures to ensure accuracy, reliability and usability of new services and systems.

#### 4. Implementation and training:

- Service launch: Implementation of new online services and updated information systems for public and professional users.
- Training programmes: Provide comprehensive training for EKXA S.A. staff and stakeholders to ensure effective use and management of the new systems.

The project aims to achieve several significant results that will benefit both the public and professional users:

##### 1. Increased availability of services:

- User-friendly platforms: New online platforms provide easier access to cadastre information and services, improving user experience and satisfaction.

##### 2. Improved transaction efficiency:

- Electronic services: the move to electronic transactions reduces the time and effort required in real estate processes, benefiting both individuals and companies.

##### 3. Precise environmental data:

- Updated NATURA boundaries: The redrawing of NATURA 2000 sites provides accurate environmental data, supporting better management and conservation.

##### 4. Compatibility and interoperability:

- INSPIRE compliance: Alignment with the INSPIRE Directive ensures interoperability of Greek spatial data systems with those of other EU countries, facilitating cross-border data sharing and cooperation.

## **7) Adaptation of the workforce in private sector companies through the upgrading of digital skills in blue economy sectors**

This study analyses an initiative to improve the digital skills of employees in private sector companies, with a particular focus on the blue economy sectors. The programme is part of the Competitiveness, Entrepreneurship and Innovation Operational Programme, with a budget of €12,570,000. The initiative aims to provide guidance, training and certification to 5,500 employees, enabling them to adapt to new development requirements, increase their employability and ensure their retention in the labour market.

The main objectives of this initiative are:

1. Counselling, training and certification:
  - Digital skills development: Providing comprehensive digital skills training relevant to blue economy sectors.
  - Certification: Certification of 5,500 employees to confirm their new skills and competencies.
2. Increasing employment opportunities and adaptation:
  - Improving employability: Increase the employability of workers by equipping them with updated digital skills.
  - Market retention: Ensuring employees are competitive and maintain their position in a changing labour market.
3. Supporting the blue economy sectors:
  - Sector focus: Targeting skills relevant to the blue economy, covering a range of occupations and activities.

## **Implementation strategies**

The implementation of the programme involves several strategic stages:

1. Needs assessment and planning:
  - Skills gap analysis: Conduct an assessment to identify digital skills gaps in blue economy sectors.
  - Strategic planning: Development of a detailed plan outlining training modules, certification processes and implementation schedules.
2. Development and implementation of training programmes:
  - Training programme: Development of specialised training programmes focusing on digital skills relevant to the blue economy.
  - Training delivery: Using both online and in-person training methods to ensure broad accessibility and effective learning.
3. Advice and support services:
  - Career counselling: Provide career counselling services to guide workers through their skills development pathway.
  - Continuous support: Offer ongoing support to ensure successful completion of training and certification programmes.
4. Certification and validation:
  - Certification processes: Implement robust certification processes to validate skills acquired by employees.
  - Industry recognition: Ensure that certifications are recognised by industry stakeholders, increasing their value in the labour market.

The programme targets 5,500 potential beneficiaries who are employees of private sector companies, regardless of their sector. It focuses not only on employees already working in the blue economy sectors but also on those who want to upgrade their skills related to these sectors.

Anticipated outcomes of this initiative include:

- Improving skills: Workers will acquire new digital skills, increasing their proficiency and ability to operate in blue economy sectors.
- Competitiveness in the labour market: Workers will become more competitive, increasing their chances of securing and maintaining employment.
- Sector development: The programme will contribute to the development of the blue economy by providing a skilled workforce capable of meeting its changing demands.
- Economic growth: By improving the skills of the workforce, the programme will support wider economic growth and innovation in blue economy sectors.

The initiative to improve the digital skills of workers in the private sector, particularly in the blue economy, is a strategic effort to meet the changing demands of these sectors. By providing comprehensive training, certification and support services, the programme aims to increase employability, support sectoral development and contribute to economic growth.

#### **9) Modification of the "ELEKTRO-ENERGY" programme – upgrading the skills of private sector employees**

The 'ELECTRRO-ENERGY' project, implemented by the Panhellenic Federation of Electrical Contractors' Associations (P.O.S.E.H.), aims to train 980 employees from the private sector in various companies and industries. The initiative is part of the Operational Programme 'Competitiveness, Entrepreneurship and Innovation 2014-2020' and has now undergone its third modification. The project aims to provide two specialised training programmes with a focus on contemporary skills related to smart building programming and maintenance automation.

The main objectives of the "ELEKTRO-ENERGY" project are:

- Skills development: Equipping 980 employees with advanced technical skills through two training programmes.
- Certification: Ensuring that participants receive certificates recognised by an accredited body in accordance with international standards.
- Smart Buildings Programming: A 50-hour course focusing on programming for smart buildings.
- Automation maintenance and control: An 80-hour course on the maintenance and inspection of automation systems.

The implementation of the project involves a detailed and structured approach to ensure that training is delivered effectively and that the objectives set are achieved:

1. Training programmes:

- Curriculum development: Creation of comprehensive training programmes tailored to the needs of the electrical and automation sector.
- Training sessions: Organise 50 training sessions in all 13 regions of Greece, providing both theoretical and practical knowledge.

2. Certification process:

- Accredited certification: Work with an accredited certification body to provide formal recognition and validation of acquired skills.
- Compliance with international standards: Compliance with international standards (ELOT EN ISO/IEC 17024) for certification to ensure wide acceptance and reliability.

3. Theoretical and practical training:

- Theoretical instruction: Providing the in-depth theoretical knowledge necessary to understand the technical aspects of smart building programming and automation maintenance.

- Practical training: Conduct practical sessions at licensed KDBM1 or KDBM2 facilities using case studies to simulate real-life scenarios.

The project targets 980 employees from a variety of private sector companies, regardless of the specific industry or company. This broad approach ensures inclusivity and allows a wide range of employees to benefit from the training programmes, increasing their skills and employability.

The expected results of the "ELEKTRO-ENERGY" project include:

1. Enhanced technical skills:

- Skill acquisition: Participants will acquire advanced skills in smart building programming and automation maintenance.
- Certification: Workers will receive formal certification confirming their newly acquired competencies.

2. Increased employability:

- Career development: enhanced skills and certification will improve participants' employability and career prospects.
- Market competitiveness: certified workers will be more competitive in the labour market, contributing to the overall quality of the electrical workforce.

3. Sector development:

- Industry development: By upskilling the workforce, the project will support the development and modernisation of the electrical and automation sectors.

To ensure the success of the project, continuous monitoring and evaluation are crucial:

1. Adherence to deadlines:

- Strict schedule: Adherence to implementation schedules for both the preparatory and main phases of the project.



- Progress monitoring: Regular monitoring of the progress of training sessions and certification processes to ensure their timely completion.

2. Compliance with project conditions:

- Implementation compliance: Ensuring that all aspects of the project comply with the terms of the inclusion decision.
- Contingency planning: Be prepared for potential deviations from the plan and implement contingency measures.

The ELECTRRRO-ENERGY project is a strategic initiative to improve the technical skills of private sector employees, focusing on the critical areas of smart building programming and automation maintenance. By providing specialised training and certification, the project aims to increase employability, support sectoral development and contribute to the overall competitiveness of the Greek workforce.

**10) 'Training and certification of skills and competencies of workers in the insulation sector' with O.P. code 5003012 under the Operational Programme 'Competitiveness, Entrepreneurship and Innovation 2014-2020'.**

The Insulation Worker Training and Certification Programme, funded under the Competitiveness, Entrepreneurship and Innovation Operational Programme 2014-2020, aims to improve the professional skills of private sector workers in various industries. This study aims to comprehensively assess the effectiveness, impact and implications of the programme, providing insightful conclusions and recommendations for its optimisation.

Methodology:

1. Data collection: Comprehensive data was collected on programme delivery, participant demographics, training content and certification outcomes.

2. Analysis: The data collected was analysed to assess the effectiveness of the programme in achieving its objectives, to identify strengths, weaknesses, opportunities and threats (SWOT analysis) and to understand its impact on participants and the industry.
3. Evaluation: An evaluation framework was used to measure the success of the programme in enhancing participants' skills, meeting industry needs and promoting growth and innovation.

#### Results:

1. Effectiveness: The programme effectively provides vocational training and certification to private sector workers, addressing specific industry needs such as complex insulation systems, energy efficient interventions and modern construction methods.
2. Impact: Participants demonstrate improved skills and knowledge, contributing to increased productivity, quality and innovation in the insulation sector. Certification increases participants' professional credibility and market opportunities.
3. Challenges: Limited coverage in less developed regions, logistical constraints in implementing the programme, and potential gaps between training content and industry requirements present challenges.
4. Opportunities: Collaboration with industry stakeholders, the use of digital platforms for remote training and the adaptation of training modules to different industry segments provide opportunities to improve the programme.

The training and certification programme has had a positive impact on the insulation sector, upskilling the workforce and aligning training with industry needs. Despite its effectiveness, challenges such as regional differences and logistical constraints require strategic interventions to optimise the programme. Continuous evaluation and adaptation of training content, delivery methods and outreach strategies are essential to maintain the programme's success. The insulation training and certification programme shows significant potential to support economic growth, innovation and workforce development. By addressing challenges, seizing

opportunities and implementing strategic recommendations, the programme can continue to have a significant impact on the insulation industry and contribute to overall socio-economic development.

**11) Sixth amendment to the action "Training and certification of workers in the environmental sector" with O.P.S. code 5002563 in the Operational Programme "Competitiveness, Entrepreneurship and Innovation 2014-2020".**

The Sixth Amendment to the Action "Training and Certification of Workers in the Environmental Sector" is a strategic initiative to improve the professional skills and qualifications of workers in this key sector. As part of the Competitiveness, Entrepreneurship and Innovation Operational Programme 2014-2020, this amendment, proposed by the Association of Societies – Ltd, outlines a comprehensive action plan to achieve its objectives.

The main objectives of this change are as follows:

1. Training of 1,000 beneficiaries: The amendment aims to provide specialised training to 1,000 workers to equip them with additional knowledge and skills relevant to their professions. This training is expected to have an immediate and positive impact on enhancing their professional capabilities.
2. Certification of acquired skills: At the end of the training programme, the beneficiaries will undergo examinations to obtain a certification of their acquired skills and knowledge. It is expected that this certification process will have a positive impact on their employability and career prospects.

Funding conditions:

The funding conditions set out in the amendment impose certain obligations on the beneficiary to ensure compliance with the integration decision and successful implementation of the action. These conditions include:

1. Compliance with the integration decision: The beneficiary is obliged to comply with the conditions and timetable set out in the integration decision and to fulfil all the obligations set out in the attached Annex I.
2. Compliance with the schedule: The beneficiary must comply with the timetable for the implementation of the action and its sub-projects, including the deadlines for preparatory activities, assignments and completion of tasks.
3. Financial management: Any deviation from the implementation schedule may result in an automatic withdrawal of the integration decision, requiring corrective measures and a potential reassessment of the action.
4. Operational efficiency: The beneficiary must ensure the operational success of the operation by taking all necessary measures within the regulatory framework and the scope of its operational and maintenance responsibilities.
5. Communication and reporting: Timely communication and reporting of progress to the Special Operational Programme Management Service is essential, including documentation related to the physical and financial implementation of the action up to its completion.

The Sixth Amendment to the Action "Training and certification of workers in the environmental sector" represents a significant step towards enhancing the professional skills and qualifications of workers in this key sector. By providing specialised training and facilitating certification, the amendment aims to improve employability, promote career development and contribute to the overall competitiveness and innovation of the environmental industry. It is recommended that the beneficiary strictly adhere to the terms and conditions set out in the integration decision and implement the action in a timely and effective manner. Regular monitoring, evaluation and reporting mechanisms should be established to track progress and respond to any deviation from the implementation schedule. In addition, collaboration with relevant stakeholders and industry experts can further enhance the effectiveness and impact of the training and certification programme.

## 12) Improving professional skills in the insulation sector

In the field of workforce development, initiatives to improve professional skills play a key role in adapting the skills of workers to the changing needs of industry. The Fifth Amendment to the Action "Training and certification of knowledge and skills of workers in the insulation sector" under the Operational Programme "Competitiveness, Entrepreneurship and Innovation 2014-2020" embodies such an endeavour, focusing on strengthening the capacity of private sector workers in various fields in the insulation sector, while recognising and accrediting their professional skills.

The overarching aim of this initiative is twofold: to strengthen the competencies of those employed in the private sector and to validate their skill sets against recognised standards. This two-pronged approach not only empowers employees but also provides them with tangible credentials that highlight their proficiency in a particular field.

Central to the implementation of this initiative are two key activities: Training and Certification. The training component, comprising some 44 specialised vocational programmes, serves as the basis for equipping 1,000 private sector employees with the necessary knowledge and skills. Meticulously designed based on market research and the discerned educational needs of potential beneficiaries, these programmes cover a spectrum of topics crucial to the insulation sector. Ranging from the organisation of complex insulation system applications to hygrothermal insulation interventions for energy conservation, each programme lasts 90 hours and adopts a blended approach that includes theoretical instruction along with practical exercises.

Complementing the training component is the certification activity, which aims to confirm the acquired knowledge and skills of participants through rigorous assessment procedures carried out by accredited certification bodies. In accordance with the international standard ISO/IEC 17024, the certification process not only serves as a certificate of proficiency for individuals but also ensures compliance with standardised procedures adapted to the training programme.

The scope of this initiative goes beyond mere skills upgrading and accreditation; at its core is a commitment to equitable distribution and regional development. Through targeted interventions in less developed, transitioning and more developed regions, the initiative seeks to address regional disparities while promoting inclusive growth and economic resilience.

Underpinning the successful implementation of these activities are the additional measures outlined in Subproject 1. These include meticulous management and coordination of project activities to ensure timely completion and achievement of pre-defined objectives. In addition, the emphasis on publicity and visibility emphasises the importance of clear communication and stakeholder engagement, thereby facilitating the dissemination of project information and attracting beneficiaries.

Essentially, the Fifth Amendment to Action represents a holistic approach to workforce development in the isolation sector. By combining targeted training interventions with rigorous certification mechanisms and comprehensive project management strategies, it seeks not only to enhance the professional skills of the workforce but also to support sustainable growth and prosperity in the regions. As industries continue to evolve, initiatives of this nature serve as catalysts for innovation, competitiveness and resilience in today's labour landscape.

### **13) ESPA**

#### **Call for expressions of interest by POVAS**

Introduction: The Panhellenic Federation of Aluminium and Iron Craftsmen (POVAS) has undertaken the Action: "Training and certification of knowledge and skills of workers in the private sector by POVAS" under Action code OPS 5035140, which was covered by Decision No. 2703/884/A3/19.04.2019 (ADA 6232465X18-A1F) by the Special Secretary for the European Social Fund (ESF). Management of European Social Fund (ESF) and Public Investment Programme (PIP) Programmes in the Operational Programme "Competitiveness,

Entrepreneurship and Innovation 2014-2020", as well as Decision No. 4598/31-08-2021 (ADA: OAI546MTLR-THNK) on the first amendment of the Measure.

**Funding and purpose:** This action is funded by the European Union (European Social Fund – ESF) and Greece with national resources under the Public Investment Programme (PIP). The objective of the measure is to adapt the beneficiaries/employees to the changes and requirements of the new business environment by acquiring new knowledge, skills and qualifications that will contribute to strengthening their position in the labour market and maximise the use of their professional skills. Specifically, it aims to provide 1150 private sector workers, regardless of the industry in which they are employed, with up-to-date knowledge and certified skills in areas of high demand in the labour market. The action is expected to have an immediate and positive impact on improving employment conditions and increasing the mobility of beneficiaries/employees, while its objectives are in line with the directions of the National Plan Greece 2020 for growth, competitiveness and employment.

**Implementation and evaluation:** in the context of the Call, POVAS announces the start of the submission of applications and supporting documents by potentially interested parties to participate in the Action from Wednesday, 23/11/2022. The Call will remain valid until the number of applications from applicants equals the number of beneficiaries foreseen in Article 2.3, increased by 25% per group of regions.

The POVAS call represents a valuable opportunity to enhance the skills and employability of private sector workers, contributing to their professional development and the overall competitiveness of the Greek economy. By implementing the recommendations outlined above, POVAS can maximise impact and effectiveness, ultimately benefiting both individual participants and the wider society.

#### **14) Cooperation agreement for free training in cutting-edge technology with Oracle Greece**

The Ministry of Digitalisation has signed a cooperation agreement with Oracle Greece to provide free high-tech training to 2,500 citizens. This initiative is in line with the goals set by the Digital Decade, which aims to train 20 million ICT professionals in the European Union by 2030.

The signing ceremony took place on Wednesday and was attended by several well-known personalities, including:

- Minister for Digital Governance, Dimitris Papastergiou,
- Secretary-General for Information Systems and Digital Governance, Dimosthenis Anagnostopoulos,
- Vice President of Technology for Europe, Middle East and Africa at Oracle, Roman Biller,
- Stefanos Dionysopoulos, Country Leader and Cluster Leader for Greece, Bulgaria, Cyprus and Malta at Oracle,
- The collaboration aims to increase the technological skills of middle – and high-skilled citizens in high-demand technologies, thus strengthening the national talent pool for new technologies.

Through the National Alliance for Digital Skills and Employment, interested citizens will have access to more than 40 on-demand training courses in 16 subject areas, covering a total of 250 hours of instruction. The courses will cover cutting-edge technologies such as:

- Cloud computing,
- Artificial intelligence,
- Mobile application development.

It is expected that the first set of courses will be available in the summer of 2024. The training content will be updated throughout the three-year partnership, ensuring that it remains current. Upon successful completion of the training, participants will have the opportunity to obtain certification by passing examinations.



The initiative positions Greece as the first country in the European Union to offer free Oracle-led courses focusing on advanced and specialised digital skills. Around the world, similar training programmes are typically offered at a high cost, making this a significant opportunity for Greek citizens. The National Alliance for Digital Skills and Employment is part of the European Alliance for Digital Skills and Employment. It operates within the General Secretariat for Information Systems and Digital Governance of the Ministry of Digital Governance. Its main mission is to improve digital skills, increase employment and support digital transformation at national, regional and local levels. The initiative is part of the government's broader skills development policy.

The collaboration between the Ministry of Digital Governance and Oracle Greece represents a major step forward in enhancing the digital skills of Greek citizens. By providing free access to advanced training, the initiative supports national and EU targets to increase the number of ICT professionals, thus contributing to the broader digital transformation agenda.

## **15) Programmes for computer and network technicians**

This programme aims to develop the necessary technical skills to install and configure digital communication devices and software on network equipment. In addition, it aims to teach troubleshooting, cabling installation and maintenance, user access configuration, email configuration, printer and scanner configuration, server configuration and network security functions. Participants will gain adequate knowledge to implement and maintain infrastructure, access hardware, operating systems, and network services and apply network security and technical standards.

This programme provides a broad overview of the duties and responsibilities of a computer and network technician. A computer and network technician is a professional who installs operating systems, develops computer and server applications with access to networks and databases and performs general computer maintenance. They also install

and configure small local computer networks. Upon completion of the programme, participants will be able to understand data processing, recognise the structural elements of computers and networks and understand resource allocation, information exchange and communication in a computer system. They will be familiar with the process of designing and developing applications and the principles of operating systems. They will be able to assemble a personal computer and install a network using appropriate hardware. In addition, they will know how to organise a computer system maintenance workshop and effectively troubleshoot any software or hardware problems. Finally, they will have the necessary knowledge to propose complex networking solutions, from home setups to small businesses. This programme equips participants with the necessary technical skills and knowledge required in today's digital age. Providing comprehensive training in computer systems and networks it prepares individuals for a variety of IT roles, from technical support to network administration. The programme's emphasis on hands-on learning ensures that participants gain practical experience, making them a valuable resource in the job market. Overall, the programme plays a key role in bridging the skills gap in the technology sector and enabling individuals to succeed in the digital world.

## **6. LAEK**

The 2019 Vocational Training Programme for Small Business Employees (LAEK 1-49) defines the objectives, beneficiaries, eligible enterprises and participants, training providers, implementation structures, training modules and the role of the federation. The programme aims to expand training opportunities for small business employees and is subject to the regulatory framework established by the ELKEP Committee.

Key programme parameters include:

1. Eligible beneficiary entities:
  - Primary and secondary employer organisations,
  - Scientific associations,

- Chambers of Commerce,
  - Work centres,
  - Federation of Employers' Organisations.
2. Eligible companies:
- Employers subject to LAEK contributions with 1-49 employees,
  - Each company can participate in training programmes with more than one employer organisation
3. Eligible participants:
- Employees of eligible companies with 1-49 employees,
  - Employees whose work allows for stable employment,
  - Employees must not be declared in another scheme and must have worked at least 50 days in the previous year.
4. Training providers:
- Level 2 accredited continuing education centres (KEK2) certified by EOPPEP,
  - Requirement to employ administrative staff and sign contracts with KEK2,
  - New centres require a specific allocation of FTEs pending application for the scheme.
5. Training implementation structures:
- Certified KEK2 centres or space rented from certified KEK2 or KEK1 centres with disabled access,
  - Approved programmes must not exceed four times the provider's capacity.

6. Training modules:
  - Two types: Type A for employees of qualifying companies and Type B for employees whose work does not allow for stable employment,
  - Professional speciality categories for trainees.
7. The role of the federation:
  - Federations receive a percentage for advertising activities to their members.

In addition, the process of evaluating and selecting programme proposals is presented, including scoring criteria and submission guidelines based on the number of member companies of the organisation. The study provides a comprehensive understanding of the structure, parameters and evaluation process of the programme, facilitating its effective implementation and management.

## **7. EPAL – Secondary vocational education (Επαγγελματικά Λύκεια – EPAL)**

Example programmes:

- IT departments:
  - Information technology: courses include programming, database management and network administration.
  - Multimedia and web development: Training in graphic design, multimedia production and web development.
  - Features: Integration of theoretical and practical classes, partnerships with local IT companies for internships and state-of-the-art computer labs.
- Electrical departments:
  - Electrical engineering: subjects include electrical circuits, power systems and automation.

- Renewable energy technologies: Training in solar, wind and other renewable energy technologies.
- Features: Practical workshops, collaboration with energy companies and opportunities for practical projects.

### **2.3 Description of how to plan for VET needs in the IT and electrical professions**

IEK – Institute of Vocational Training (Ινστιτούτο Επαγγελματικής Κατάρτισης – ΙΕΚ)

#### **Network and telecommunications technician**

The field of information technology (IT) has become one of the most dynamic and integral sectors of modern society. Within this expansive domain lies the specialised discipline of networking and telecommunications technologies. With a focus on 'Τεχνικός Δικτύων και Τηλεπικοινωνιών', the IEK programme epitomises the convergence of technical knowledge and communication proficiency required to navigate the complexities of modern networked systems.

Admission to the programme requires a secondary school level qualification from a variety of institutions, including Secondary School (ΓΕΛ), Technical Vocational High School (ΤΕΛ), Unified Multi-Class High School (ΕΠΑ), Second Cycle Technical Vocational Training Institute (ΤΕΕ), Vocational High School (ΕΠΑΛ), Vocational School (ΕΠΑΣ) and Vocational Training School (ΣΕΚ). These prerequisites emphasise the programme's commitment to inclusivity and accessibility, ensuring that individuals from different educational backgrounds can embark on a journey of professional development in the field of networking and telecommunications technologies.

Upon successful completion of the KDVM programme, participants receive a vocational training certificate (B.E.K.), confirming the acquisition of specialised knowledge and skills. Subsequently, successful

completion of the certification examinations conducted by the National Organisation for the Certification of Qualifications and Vocational Guidance (E.O.İİ.E.İİ.) culminates in the award of a Level 5 Vocational Education and Training Diploma. These certifications serve as tangible manifestations of the rigorous training and dedication demonstrated by programme graduates, confirming their competence to operate in the demanding landscape of networking and telecommunications technologies.

Central to the KDVM curriculum is a comprehensive structure designed to impart theoretical knowledge and practical proficiency over five semesters. The programme unfolds over four semesters of theoretical and laboratory teaching, covering up to 1,200 specialisation-specific teaching hours. This pedagogical approach ensures that students gain a solid conceptual framework while honing their technical skills in real-world settings. In addition, a semester-long practicum or internship covering 960 hours provides invaluable hands-on experience, allowing students to apply theoretical concepts to practical scenarios and develop industry-relevant competencies.

The duration and composition of the programme emphasise its commitment to holistic education, combining theoretical knowledge with practical application to cultivate well-rounded professionals prepared to excel in the dynamic field of networking and telecommunications technologies. Adhering to rigorous standards and adopting a multi-faceted approach to learning, the programme prepares graduates to navigate the complexities of modern IT infrastructure with confidence and proficiency, thereby contributing to the ongoing evolution and innovation of the field.

The 'Computer Technician' specialisation involves the intersection of technological knowledge and practical application in the field of information technology. This essay delves into the multi-faceted dimensions of the programme, highlighting its curriculum, entry requirements, certifications and career prospects.

At the outset, it is important to highlight the foundations of the programme within the Institutes of Vocational Training (IEK) in accordance with the provisions of Law 4186/2013 governing the restructuring of secondary

education in Greece. Designed for graduates of secondary schools and vocational training schools (SEK), the 'Computer Technician' programme embodies a comprehensive approach to preparing individuals for a career in computing.

Within the broader field of information technology, the 'Computer Technician' specialisation is located in the 'Information Technology' sector and the 'Technology Applications' orientation group. This placement reflects the programme's emphasis on equipping students with practical skills and theoretical knowledge related to contemporary computer technologies.

Admission to the programme requires a secondary education from a variety of institutions, including a High School (ΓΕΛ), Technical Vocational High School (ΤΕΛ), Unified Multi-Class High School (ΕΠΛ), Second Cycle Technical Vocational Training Institute (ΤΕΕ), Vocational High School (ΕΠΙΑΛ), Vocational School (ΕΠΙΑΣ) and Vocational Training School (ΣΕΚ). These requirements ensure a diverse cohort of students with different backgrounds, supporting an inclusive learning environment at IEK.

Upon successful completion of the programme, graduates receive a vocational training certificate (B.E.K.), certifying their proficiency in computer technology. In addition, successful participation in the certification examinations conducted by the National Organisation for the Certification of Qualifications and Vocational Guidance (Ε.Ο.Π.Ε.Π.) leads to the award of a Level 5 Vocational Education and Training Diploma. This qualification confirms the competence of graduates and increases their employability in the growing field of IT.

The Computer Technician curriculum spans five semesters, including four semesters of theoretical and laboratory classes with a total of 1,200 teaching hours, as well as a semester-long internship or apprenticeship covering 960 hours. This holistic approach combines theoretical concepts with practical experience, ensuring that students develop both the fundamental knowledge and practical skills necessary to succeed in the field.

The professional profile of a computer technician covers a wide range of responsibilities, including performing tasks related to computer hardware and networks independently or in teams. Graduates are prepared to seek employment in a variety of sectors, including companies, organisations, ministries and commercial enterprises that use computer systems. In addition, they can explore roles in product development, sales, technical support, electronic repair labs and independent installations in buildings, industry and crafts.

Key professional competencies acquired as part of the programme include proficiency in computer hardware operation, network administration and troubleshooting. Graduates are skilled in managing computer peripherals, configuring network connections, administering user accounts and activating communication devices. In addition, they are proficient in diagnosing hardware failures, replacing faulty components and upgrading computer systems to increase performance and functionality.

In summary, the 'Computer Technician' specialisation in vocational training embodies the convergence of theoretical knowledge and practical skills necessary to navigate the complexity of today's computer technologies. By fostering a conducive learning environment, providing practical experience and imparting industry-relevant competencies, the programme enables graduates to embark on a successful career in the dynamic field of information technology.

### **KDVM (continuing education centres)**

Example programmes:

- IT courses:
- Website development: HTML, CSS, JavaScript and CMS (e.g. WordPress).
- Data analysis: Excel, Python for data analysis and SQL.
- Digital marketing: SEO, social media marketing and online advertising.



- Features: Flexible learning schedules, courses designed with adult learners in mind and practical projects.
- Electrical courses:
  - Basic electrical skills: Residential and commercial electrical installations.
  - Advanced electrical systems: Industrial automation, PLC programming and renewable energy systems.
- Features: Evening and weekend classes tailored to the needs of working adults, as well as practical training.

## **Summary**

The Greek vocational training programmes offered by IEK, DYPA, KDVM and EPAL provide a comprehensive education in IT and electrical professions. They respond to the link between vocational education at different levels and the needs of the labour market and the economy in the context of computerisation and digital transformation.

These programmes emphasise practical skills, collaboration with industry and modern facilities to prepare students for the labour market. The Greek market provides valuable insights and practices in the education and training of IT and electrical professionals. Key approaches include strong collaboration with industry, modern curriculum design, effective promotion of vocational education and training and strategic planning for future skills needs.

## **Conclusions**

The effectiveness of these programmes can be attributed to:

- Practical training: Emphasis on practical learning and real-world experience.
- Industry partnerships: Working closely with companies to provide relevant training and apprenticeships, which are also essential to ensure relevant and up-to-date training.

- Modernising vocational education and training: Investing in modern training facilities and implementing the latest technology significantly improves the quality of education.
- Awareness and attractiveness: Raising awareness of the benefits of VET and providing financial incentives can attract more students to these pathways.
- Strategic planning: continuous analysis and stakeholder engagement ensure that VET programmes remain aligned with industry needs and future trends.

### **Recommendations**

1. Fostering lifelong learning: Encourage continuous professional development and lifelong learning to keep skills current and relevant.
2. Strengthen cooperation with industry: Strengthen partnerships between VET providers and industry to ensure that curricula are in line with current and future skills needs.
3. Investing in modern facilities: Allocate funds to upgrade training facilities and equipment, providing students with a high-quality learning environment.
4. Integration of technology: Use of digital platforms for online training modules, interactive simulations and virtual workshops to increase accessibility and flexibility.
5. Promote vocational education and training pathways: Implement comprehensive awareness campaigns and financial incentives to attract more students to VET.
6. Regular curriculum updates: Continually update curricula to incorporate new technologies and practices, ensuring graduates are prepared for the changing labour market.
7. Increased outreach: Implement targeted initiatives to reach less developed regions and marginalised communities, ensuring equal access to training opportunities.

By adopting these strategies and learning from Greek successes but also shortcomings, the EU can improve the quality and attractiveness of vocational education and training, ensuring a skilled workforce ready to meet the challenges of the digital and energy transition.

## **CHAPTER 3**

### **"A study containing conclusions and recommendations for the adaptation and incorporation of learned experiences of solutions, good practices from the polish market" – a description of the approach to providing professionals in the it and electrical professions with specific**

#### **Introduction**

In Poland, the legal obligations of the state are hierarchical and defined by individual acts:

- Constitution:

Article 70. states that every citizen has the right to education. Education up to the age of 18 is compulsory. The manner in which compulsory education is carried out shall be determined by law.

- Education System Act (of 7 September 1991, amended several times):

It specifies that the vocational curriculum refers to the description of how the learning objectives and learning content are established in:

- a) the programme basis of education and training in the occupation of vocational education and training, in the form of expected learning outcomes, taking into account the distinction of qualifications in the, in accordance with the classification of occupations of vocational education and training, the curriculum for the occupation shall include curricula for individual compulsory education and training classes in the occupation,
- Education Law (of 14 December 2016 as amended)  
Among other things, it defines the rules for the organisation of VET education.

- REGULATION OF THE MINISTER OF NATIONAL EDUCATION (of 16 May 2019 as amended) on the core curriculum for education in trade school occupations and additional professional skills for selected trade school occupations.

It defines the core curricula for the vocational training professions assigned to the industry, including:

- to the electricity industry (ele),
- to the electronics and mechatronics (elm) industry,
- to the ict (inf) sector,

Curriculum bases for education in the occupations assigned to the ICT industry as defined in the classification of occupations of vocational education:

- 1) fitter of telecommunications networks and equipment;
- 2) IT technician;
- 3) Programming technician;
- 4) broadband electronic communication techniques;
- 5) ICT technician;
- 6) telecommunications technician;
- 7) a technician of information and communication technology.

Using 1) telecommunications network and equipment fitter as an example, the core curriculum includes:

- QUALIFICATION DESIGNED IN THE PROFESSION:  
Installation and maintenance of telecommunication tracks and subscriber equipment,
- LEARNING OBJECTIVES.

Performing professional tasks:

- 1) installation and maintenance of telecommunications routes,
- 2) to perform measurements of transmission parameters in telecommunication lines,
- 3) installation and configuration of subscriber equipment,

– LEARNING EFFECTS AND CRITERIA FOR THE VERIFICATION OF THESE EFFECTS in the areas:

Health and safety at work, Fundamentals of telecommunications, Installation and maintenance of telecommunication routes, Measurement of transmission parameters in telecommunication routes, Installation and configuration of subscriber equipment, Professional foreign language, Personal and social competencies,

The described system in Poland indicates a very formal way of vocational training. Possible changes are introduced in this system by Decrees of the competent Minister, an example of which is the introduction of a new additional vocational skill entitled "Running a farm in the organic farming system". The change was introduced at the request of the ministers responsible for these professions.

[\(https://www.ore.edu.pl/2022/06/podstawy-programowe-ksztalcenia-w-zawodach-2021-2/](https://www.ore.edu.pl/2022/06/podstawy-programowe-ksztalcenia-w-zawodach-2021-2/) accessed 19.03.2024)

The introduction of changes or modifications to VET education must be carried out within the educational system and be initiated by the competent minister for the school profession concerned. Thus, we are dealing with supplementary changes to the current legal status regarding the list of school professions. In 2024, a new profession – electromobility technician assigned to the 'automotive industry' – was added to the Regulation on the core curriculum for education and training in vocational training.

[\(https://legislacja.rcl.gov.pl/projekt/12381800/katalog/13035814#13035814](https://legislacja.rcl.gov.pl/projekt/12381800/katalog/13035814#13035814) accessed 19.03.2024 r.)

Training in the qualifications identified in the profession of electromobility technician will also be able to be provided on qualifying vocational courses or vocational skills courses. Learning will take place within two qualifications:

- Maintenance, diagnosis and repair of mechatronic systems of motor vehicles,
- Organising and running the service and repair process for zero – and low-emission vehicles.

This demonstrates the consideration of factors influencing changes in the economic and social environment that condition the tasks of the school and other vocational education providers, i.e. the 'ecological and digital transformation'.

The education system is creating new models for how best to prepare young people to function efficiently in a rapidly changing reality.

In addition, at the Polish level, the Strategy for Responsible Development and the National Strategy for Regional Development 2030 have been developed. The NDS recognises that digitisation is a fundamental factor stimulating citizens' access to services, together with the resulting economic and social benefits. The strategy, therefore, sets out directions for the development and modernisation of ICT and telecommunications infrastructure and assumes the creation of a modern electronic communications infrastructure with the implementation of next-generation wireless networks (5G). In addition, the NSRF sets out the tasks to be performed within the framework of further computerisation of the economy and increasing network capacity. It indicates as a priority the provision of broadband Internet access to the widest possible group of recipients as part of strengthening the development opportunities of areas threatened by permanent marginalisation. This is in response to the identified challenges associated with the implementation of European Union policies.

### **3.1. Description of ways to promote and enhance the attractiveness of vet education at ISCED 3-4 in the context of EU policy needs.**

For the project, practices were identified to promote and enhance the attractiveness of VET education, including vocational information and electrical engineering. These practices were and are being implemented by a higher education and secondary education provider.

#### **Project "Professional compass – responsible choice of a vocational school" (operational programme knowledge education development)**

The project was implemented in an international partnership with the International Academy of Applied Sciences in Lomza (PL) and Bildungsverbund Thringer Unternehmen. V. in Erfurt (DE).

**MAIN OBJECTIVE OF THE PROJECT:** To better adapt, in the period 01/2019-03/2022, the education system in Poland at the primary school level to the needs of the labour market by developing a new solution using the experience of the transnational partner BVTU (DE), including an Educational Programme with an ICT tool and a Guide to increase the ability of primary school students to choose a VET course responsibly.

The need addressed by the project was to increase the quality of the educational process of preparing primary school pupils for the choice of post-primary school with a focus on VET education, ensuring cooperation with the business community and the socio-economic environment, preparing teachers for innovative vocational orientation classes ensuring implementation in a way that engages pupils in vocational activities in vocational laboratories or its equivalent, having didactic materials for the implementation of the above classes.

The project responded directly to the problem of misguided choices of educational direction and future profession. This results in the abandonment of education in the chosen direction and profession within a short period of time after starting this education. Furthermore, the project responded to the need to increase the attractiveness of VET



education. Therefore, a key solution to support the choice of VET education is to learn about the realities of the future profession. The project confirmed that the appropriateness of the choice of further educational and vocational pathway increases if, at the last stage of general education (primary school), the student has the opportunity to practice the profession.

Within the framework of the project, the solutions of the German partner BVTU were adapted to the developed educational programme (<http://ict.wsa.edu.pl/moduly/>), whose activities were a response to the problem of the lack of knowledge among pupils leaving primary school of the realities of their future profession in relation to the chosen vocational training course. Therefore, the assumptions of the "Berufsstart plus" project were used as good practice, which brought the specifics of a given profession cognitively and not just theoretically closer. Students in the BVTU project took part in practical classes at the Vocational Training Centre, visited companies, and observed work activities in their chosen professions. The applied solution on the German market was possible because of the dual system of VET education, in which the entrepreneur is responsible for vocational preparation. A new innovative solution in the BVTU project was individual profession-specific learning as an element of increased student support.

In the Vocational Compass project, due to the lack of opportunities for students under 15 to complete vocational assignments in companies, alternative solutions were introduced by establishing cooperation with vocational schools. This made it possible to realise the idea of learning about practical vocational activities by having pupils take part in classes in the vocational workshops of VET schools. During these classes, pupils perform vocational activities specific to their profession.

More than 20 primary schools in the Mazowieckie and Podlaskie voivodeships use the developed educational programme as an open educational resource. Four vocational schools participate in the implementation of classes in the laboratories.

## **Project "Learning about and using good practice in the development of vocational training as a good alternative to general education through visits to Thuringia."**

The project was implemented in international partnership with the International Academy of Applied Sciences in Lomza (PL) and FAV Service gGmbH in Gotha (DE).

**MAIN OBJECTIVE OF THE PROJECT:** To improve and acquire professional competencies in the field of cooperation with employers, promotion of the educational offer among students and parents and educational quality solutions among GD management staff of vocational schools, representatives of the managing bodies of these vocational schools, vocational counsellors cooperating with vocational schools through visits to institutions operating in the vocational training sector in Thuringia 100 persons.

The project is in line with the National Strategy for Regional Development, indicating the need to build a positive image of VET schools and vocational education, to improve the education system at all levels so that it is oriented towards the needs of regional labour markets, the requirements of an innovative economy and professions associated with energy and digital transformation. It is intended that the implementation of the project will contribute to an increase in the popularity of vocational education, including in the professions of IT and electrical engineering.

The project responded to the problem of vocational education, i.e. the decreasing number of students choosing this educational pathway, the insufficient prestige of VET schools and their poor

link to the economic environment and the following needs:

- the acquisition of new vocational promotional skills so that vocational schools become a popular alternative to general schools,
- to learn about transnational good practice and new methods of organising vocational training and making it more attractive,

- strengthening of professional competencies in terms of training organisation methods, networking (educational establishments, companies, chambers),
- learning about the adaptation of vocational training facilities for pupils with disabilities and the mobilisation of this group of people for education professional,
- Use of good practice to improve the functioning of the branch schools in the project's content area.

Each participant developed a strategy for the development of their chosen vocational school aimed at promoting vocational training.

### **Project "Participatory Observation – a new experience and increased professional competence"**

The project was implemented in international partnership with the International Academy of Applied Sciences in Lomza (PL) and FAV Service gGmbH in Gotha (DE).

**MAIN OBJECTIVE OF THE PROJECT:** to increase, in the period 09/2019 – 09/2020, the professional competencies necessary to maintain the employment of 35 teachers of practical vocational training of ZSZ No. 1 and ZSZ No. 4 in Ostroleka and ASP in Lomza and 10 candidates for instructors practical vocational training through training in the form of participatory observation in Thuringia (Germany) organised in transnational cooperation with the partner BVTU (DE) in companies providing practical vocational training.

The project made it possible to gain practical knowledge of the dual system of VET in Germany through the example of the visited companies and organisations participating in the process. This served to prepare participants for the implementation of the dual system in Polish conditions as a way of promoting and raising the attractiveness of VET education, including in the electrician and IT professions. A specific feature of the project was that the participants in the mobility group were teachers of practical vocational training, vocational instructors, entrepreneurs, and their employees. The implementation increased interest in choosing

vocational education in the schools from which the project participants came.

The aforementioned projects were aimed at both learning about good practice in, among other things, promoting VET education and learning about vocational orientation tools to guide students leaving primary school level to choose VET education as a future profession responsibly and to use/adapt them in their practice.

**The projects "Good profession – safe work" edition I and II and "Comprehensive development programme at the Academy of Fine Arts in Lomza".**

The projects were implemented in partnership with the International Academy of Applied Sciences in Lomza, which is the leading body of the IT Technical School and the Regional Development Agency in Lomza.

The main objective of these projects was the acquisition of practical knowledge and professional experience by pupils/students and the updating of professional competencies by teachers at the ASP (Technical School of Information Technology in Lomza) in connection with the requirements of local businesses.

The innovative approach of the project, "Comprehensive Programme of Development of the Academy of Fine Arts in Lomza," to the training of IT specialists was to equip them with complementary knowledge of a related industry – electrical engineering, strongly related to the basic course. They obtained G1 operating authorisations, which strengthened their competitiveness in the labour market and promoted the school as innovative.

Students acquired practical skills through paid work placements and vocational training. In addition, the best students receive scholarships, which allow them to develop their educational and professional development. Vocational teachers also improved their competencies. All project activities increased the attractiveness of this vocational school and its position in the education market, resulting in an annual increase in enrolment at the IT Technical School.

**Mobility projects within the Erasmus+ programme "Internships for IT students are an open European labour market for graduates of the Academy of Fine Arts". "Mobility of IT professionals for professional skills necessary for the European digital transformation of the economy".**

The projects were implemented in partnership with IT Technical School in Lomza in partnership with Golden SUN (GR) and EDUPLUS (PT).

The main objective of the projects was to increase and develop the transversal key competencies of TI students in the areas of multilingualism, entrepreneurship, and personal, social and learning competencies of students who, for social, family, economic and geographical reasons, are not achieving educational, personal and social development in line with their potential.

The implementation of the mobility activities included 28 days of mobility and 20 working days of work placements in foreign companies.

The projects have contributed to deepening and broadening pupils' professional and transversal competencies. In addition, they have built the European dimension of vocational training at this peripherally located school. In addition, they have increased the attractiveness of this vocational school and the IT faculty in the education market. The implementation of mobility projects has boosted interest in training in this area at the school.

The above-mentioned mobility projects exemplify a comprehensive approach to vocational education in the IT profession at ISCED 3-4 level not only on the basis of the core curriculum but also in terms of broad professional skills, complementary skills, language and social competencies. The comprehensive measures are presented in the open web space and are also used to promote the choice of IT training among potential candidates. The initiatives carried out are disseminated in the form of;

- face-to-face meetings with primary school pupils,
- during the secondary school education fair presenting the value of VET (computer science) education as a profession of the future, its value in the labour market from the local to the EU market, its attractiveness at the school stage, and the transition from education to employment.

As a result of the promotion of VET based on the European dimension, there are plans to launch a new training course, i.e. electrical technician, from the 2024/24 school year.

In summary, the Zespół Szkół Akademickich w Łomża, as part of which the IT Technical Secondary School operates, promotes its comprehensive approach to IT education in the European dimension as a tool for the effective promotion of its educational offer and international cooperation in the content area is also an important dimension.

It is also an important element in the promotion of the "IT" training course among primary school pupils, which, in combination with vocational orientation activities, creates a coherent multi-faceted approach in the process of guiding young people towards a future profession of IT correlated with the Green Deal.

The 'Digital Ecological Transformation – Your Project' competition was announced by the Prime Minister's Office (11.2022).

The announcement of the competition was linked to the European Year of Youth.

<https://www.gov.pl/web/pozytek/europejski-rok-mlodziezy---kancelaria-prezesa-rady-ministrow-oglasza-konkurs-transformacja-ekologiczna-cyfrowa--twoj-projekt>

The aim of the competition was, among other things:

- promoting civic attitudes and the development of civil society, with a particular focus on policies aimed at the younger generation,

- promoting the main themes of the European Year of Youth, such as inter alia, eco-digital transformation, opportunities and possibilities for young people in the European Union, young people's career prospects in the European Union, active participation in society and mental health,
- involving talented young people in activities that enhance the civic and social dimension of the public sector,
- to disseminate and implement the objectives of the European Year of Youth.

Interesting elements of the Competition in the context of the issues raised in the Project are the competition task of developing a plan and project for ecological and digital transformation in the participant's surroundings, to be implemented in Poland, in particular in the local community and based on selected areas such as:

- The European Union's youth perspective,
- Involving young people in being active citizens,
- Eco-digital transformation,
- Increasing and taking advantage of development opportunities for young people.

This competition is a good example of combining digital competencies with social competencies, targeting the creation of creative spaces in the context of digital skills and Green Transformation.

### **3.2. Description of good practices in orienting and preparing cooperating companies for the digital and energy transition and how to promote and enhance the attractiveness of vet education at ISCED 3-4 level in the context of eu policy needs**

#### **Orientation of primary school pupils to the choice of VET education on the example of Zespołu Szkół Zawodowych Nr 1 w Ostrołęce in cooperation with employers and primary schools.**

It is an initiative that takes an innovative approach to attracting vocationally-oriented students to a chosen field of study as described in the educational programme 'PROFESSIONAL COMPASS – RESPONSIBLE SCHOOL CHOICE'.

The idea is to illustrate the practical aspects of a profession by involving employers and holding classes for final-year primary school pupils in a particular vocational workshop.

Employers are aware of the need to prepare for the digital and energy transition, as evidenced by their commitment to deliver classes in the electrical and IT professions in collaboration with vocational schools.

#### **The activities of TARGOR TRACK in Ostroleka – as a company open to transformational change in the transport and sector**

It is a company with traditions operating in the logistics and transport and forwarding market since the 1970s. As a result, it has acquired the knowledge and experience that allows us to adapt smoothly to market requirements and respond quickly to changing conditions. TARGOR-TRUCK incorporates low-carbon into its sustainability policy, and reducing CO2 emissions during freight transport is increasingly becoming a tender requirement imposed on the carrier. It engages in sectoral activities, working out the best possible solutions for implementing the EU Mobility Package from the perspective of the Polish market and reconciling activities with the European Green Deal strategy. This approach creates an opening for the company to provide vocational



training in the preparation of qualified employees to meet the operational and logistical needs of the company in the context of the requirements of the transformation. It is a visionary company in the Ostroleka subregion that is implementing new solutions for decarbonising transport and fully preparing for energy and digital transformation.

TARGOR-TRUCK has undertaken cooperation with ZSZ No. 1 in Ostroleka in terms of:

- to participate in school events, e.g. Open Day, in order to promote vocational training geared towards the requirements of sustainability and transformation,
- strengthening cooperation through the Patronage of the mechanic driver training course,
- the organisation of practical traineeships for students in the company,
- the organisation of study visits with presentations of modern solutions implemented in the company as a response to the energy and digital transformation in the context of the EU mobility package,
- the involvement of Targor Truck employees as teachers/instructors of classroom and practical vocational subjects,
- making rolling stock available, e.g. an LNG truck for the educational process.

In addition, the company is undertaking national and international cooperation activities and promoting solutions to participate in the transformation processes. It is also well-prepared to change the future of business in line with the requirements of the green revolution. These activities include:

- From 2020, the purchase and successive replacement of decarbonised vehicles with LNG and BioLNG-powered vehicles will be labelled so that everyone who sees them on the road knows they are green. The company already has more than 100 such vehicles,
- Signing of a letter of intent for the purchase of an IVECO HD BEV tractor unit. This is the first electrically powered tractor model.

TARGOR TRUCK will be the first transport company with such a fleet in the region.

- the company regularly and continuously invests in its employees through their development and qualification in order to improve the quality of its services and build awareness of the dynamic changes in the transport market,
- promoting the idea of efficient and environmentally friendly fleet management and optimising the use of means of transport on the website and company Facebook page,
- active participation of company executives and employees in events at home and abroad related to the topics of transport decarbonisation and energy efficiency (e.g. "Efficiency on the road – how to keep your trailers running" organised by the editors of transiNFO together with partners ZFGroup and Goodyear.

The company believes that its choices have an impact on our future and the future of our planet.

### **Cooperation between an enterprise and a vocational school in the pursuit of qualified personnel for the transformation of the transport sector on the example of the TARGOR TRACK Company and the Vocational School Complex No. 1 in Ostrołęka.**

In an era of transformation in the transport sector, growing demand for qualified staff and dynamic technological development, cooperation between businesses and vocational schools plays a key role. One example of successful cooperation in this field is between TARGOR TRACK and the Vocational School Complex No. 1 in Ostrołęka.

#### **Purpose of cooperation**

The main aim of the cooperation is to prepare qualified human resources for the transport industry to meet the challenges arising from the transformation of the sector. Aiming to create modern competencies and develop practical skills among students is a response to the needs of the

labour market, including the transition to more sustainable and greener transport.

### **Forms of cooperation**

1. Student internships and placements:
  - TARGOR TRACK offers students of the Vocational School Complex No. 1 in Ostroleka the opportunity to complete an apprenticeship in a real working environment.
  - Pupils gain practical knowledge of truck operation, transport logistics, the use of modern technology in transport and safety and environmental principles.
2. Support in the curriculum:
  - The company is working with the school to develop curricula that take into account the latest trends in the transport sector, such as electromobility, sustainable transport and automation of logistics processes.
  - Introducing educational modules related to modern transport technologies, including telematics systems and fleet management software.
3. Training and workshops for students and teachers:
  - TARGOR TRACK organises specialised training courses for students, where they learn practical skills in commercial vehicle operation, service and maintenance, and ecological transport skills.
  - Vocational teachers also benefit from the expertise of the company's staff by participating in in-service training.
4. Funding of educational infrastructure:
  - The company supports the school by providing equipment, diagnostic tools, state-of-the-art technology and other technical means that enable practical classes to be carried out in conditions similar to the real working environment.

- Allowing access to vehicles and telematics systems allows students to gain experience with modern technologies used in road transport.
5. Recruitment support:
- TARGOR TRACK participates in the school's open day and educational fairs to promote the profession of driver-mechanic and other transport-related professions.
  - Joint promotional activities aim to encourage young people to choose vocational education as a career path that meets the needs of the labour market.

### **Benefits for students**

1. Development of practical skills – Students gain valuable work experience, which increases their employability after school.
2. Better preparation for the labour market – Graduates are ready for employment in the transport industry, which shortens the company's induction process and makes them more attractive in the labour market.
3. Employability – The best students have the opportunity to be employed at TARGOR TRACK after their education, giving them stable and well-paid jobs.

### **Benefits for the company**

1. Access to qualified staff – The company sources well-prepared graduates, reducing the cost of recruiting and training new staff.
2. Building the image of a responsible employer – Cooperation with the vocational school increases the brand recognition of TARGOR TRACK as a socially responsible company.
3. Influence on vocational training – The company has the opportunity to co-design training programmes, which allows it to match the competencies of graduates to its needs.

4. Reducing the cost of employee induction – With apprenticeships and training provided during their studies, the induction process for graduates is shorter and more efficient.

### **Benefits for the school**

1. Improving the quality of education – The school gains access to modern technology, equipment and diagnostic tools, enabling higher-quality teaching.
2. Better promotion of the school – Working with a reputable industry partner increases the attractiveness of the school and attracts new applicants to vocational education.
3. Increasing the competitiveness of the educational offer – Cooperation programmes allow the school to distinguish itself from other educational institutions and better respond to the needs of the labour market.

### **The role of transformation of the transport sector**

The transformation of the transport sector includes, among others, the transition to low-emission and electric vehicles, the implementation of intelligent transport systems and the development of modern fleet management systems. The cooperation between TARGOR TRACK and Vocational School Complex No. 1 in Ostroleka is aimed at adapting the educational offer to the needs of this transformation.

Students are trained in the operation of telematics systems, technologies related to electromobility and the automation of logistics processes. In this way, they become specialists who, in future, will be able to operate modern solutions used in road transport, e.g. ITS (Intelligent Transport Systems) technologies.

In summary, the cooperation of TARGOR TRACK with Vocational School Complex No. 1 in Ostroleka is an example of an effective model of partnership between education and business. Such cooperation brings benefits to students, the company and the school itself. Students gain practical skills, the company acquires qualified employees, and the school

increases its attractiveness. Thanks to joint activities, it is possible to prepare highly qualified personnel, which are essential in the process of transforming the transport sector towards a more sustainable, modern and ecological model of operation.

### **3.3. Description of how to plan vet education needs in the IT and electrical professions**

#### **EU level initiatives – European Year of Skills 2023**

The European Year of Skills will give a new impetus to lifelong learning. It will enable people and businesses to contribute to ecological and digital transformation, fostering innovation and competitiveness.

[https://year-of-skills.europa.eu/about\\_en?prefLang=pl&etrans=pl](https://year-of-skills.europa.eu/about_en?prefLang=pl&etrans=pl)

The European Year of Skills aims to address the skills gap in the European Union and reinforce the EU skills strategy to help people retrain, focusing on digital and green skills. This will involve helping people acquire the right skills for quality jobs and helping businesses, particularly SMEs, by highlighting national efforts as well as existing and new EU initiatives and EU funding opportunities. It will support skills activities and events across Europe.

- 77% of EU companies find it difficult to find employees with the necessary skills,
  - 20 million ICT professionals should enter the EU labour market by 2030,
  - 60% of adults should participate in training every year by 2030.
1. Promoting investment in training and upskilling, enabling people to stay in work or find new ones.
  2. Provide skills that meet the needs of employers by working closely with social partners and businesses.

3. Matching people's aspirations and skills with labour market opportunities, especially in terms of green and digital transformation and economic recovery/

Decision of the European parliament and the council (EU) 2023/936 of 10 May 2023 on the European Year of Skills [https://eur-lex.europa.eu/legal-content/PL/TXT/HTML/?uri=CELEX: 32023D0936](https://eur-lex.europa.eu/legal-content/PL/TXT/HTML/?uri=CELEX:32023D0936)

(19) The ongoing green and digital transformation of EU industry and the associated labour market needs require investment in the development of strong vocational education and training systems across the Union, promoting problem-solving skills and competencies in the area of new technologies, such as smart manufacturing and smart machines, advanced robotics, cloud computing, artificial intelligence, data processing and the internet of things.

The European Vocational Skills Week (EVSU) is an initiative of the European Commission that was launched for the first time in 2016. It aims to promote vocational education and training as an attractive career and learning pathway by bringing together all stakeholders to showcase vocational education and training opportunities and inspire best practice: "DiscoverYourTalent – EuropeanVocationalSkills".

### **Training for industries**

"Education for the needs of key industries" is the first competition announced by the National Centre for Research and Development under the European Funds for Social Development programme.

We want to invest European funds in stimulating the development of degree courses that educate staff to meet the needs of selected industries important for the development of the economy, such as renewable energy, agriculture and food industry, aerospace and transport.

## **Qualifications of the teaching staff**

In the competition 'Development of qualifications and competencies of teaching staff', from 22 May to 17 July this year, we are waiting for projects that will contribute most to improving the qualifications or competencies of teaching staff at the university, as well as the competences or qualifications of doctoral students.

Projects can be carried out independently or in partnership. They are expected to result in the acquisition or enhancement of the following qualifications or competencies in particular:

- teaching – including the use of modern teaching methods and educational methodology,
- digital,
- for a green transition.

## **Film competition entitled. "European Year of Skills!" initiative of the association "Pomerania in the European Union"**

Pupils from trade schools, technical schools and secondary schools based in the Pomeranian Voivodeship are invited to take part in the competition. The task is to record a short video (3-5 minutes) promoting the European Year of Skills, e.g. school projects in the field of improving professional skills, apprenticeships completed by students, activities within the framework of EU projects aimed at young people concerning the development of qualifications and competencies, scenes concerning professions chosen by young people and related skills, and others.

## **Vocational education programming**

ACT of 20 April 2004 on employment promotion and labour market institutions.

Art. 22 – [Labour Market Councils. Provincial and district labour market councils] – Employment promotion and labour market institutions.



Article 22 [Labour Market Councils. Provincial and district labour market councils].

(1) The Labour Market Council is an opinion-giving and advisory body of the minister in charge of labour in labour market policy matters and a decision-making body with regard to the determination of priorities for spending funds from the KFS reserve referred to in Article 109(2e).

(2) Provincial labour market councils are consultative and advisory bodies of the voivodship marshal in labour market policy matters.

(3) District labour market councils are consultative and advisory bodies of the starost in matters of labour market policy.

### **Labour Market Council**

Tasks in particular include:

- 1) To inspire undertakings aimed at full and productive employment and human resource development;
- 2) Giving an opinion on the draft National Action Plan and periodic reports on its implementation;
- 3) To give an opinion on the priorities submitted by the minister in charge of labour, the formula for the distribution of KFS funds and the plan for their disbursement;
- 4) Establishing, by sector and region, additional priorities for the disbursement of funds from the KFS reserve and deciding on the allocation of these funds in accordance with the adopted priorities;
- 5) Giving an opinion on the annual reports on the activities of the Labour Fund, as well as assessing the rationality of the management of the fund's resources;
- 6) Implementation of the tasks set out in the provisions on the protection of employee claims in the event of the employer's insolvency;
- 7) Giving an opinion on draft laws on employment promotion, mitigating the effects of unemployment and professional activation.

## **Needs planning in the IT and electrical professions on the example of the tasks of the provincial market council**

The scope of provincial market councils labour market councils includes, in particular:

- 1) To inspire undertakings aimed at full and productive employment in the province;
- 2) Assessment of the rationality of the management of Labour Fund resources;
- 3) Giving an opinion on the draft Regional Action Plan and the periodic reports on its implementation;
- 4) Giving an opinion on the criteria for the distribution of Labour Fund resources to district self-governments of a given voivodeship for financing employment promotion programmes and financing other optional tasks and giving an opinion on proposals developed by voivodeship employment offices on the allocation of Labour Fund resources at the disposal of the voivodeship self-government and reports on their use;
- 5) To make proposals and give opinions on matters concerning the directions of education, including opinions on the legitimacy of education in a given profession in accordance with the needs of the labour market, vocational training and employment in the province;
- 6) Assessing periodic reports on the activities of the provincial labour offices and presenting periodic reports and proposals on employment issues to the Labour Market Council;
- 7) Delegating representatives to the competition committee selecting a candidate for the post of director of the regional labour office;
- 8) Giving an opinion on proposals to dismiss the director of the regional labour office;
- 9) To give an opinion on the provincial criteria for issuing work permits for foreigners;

- 10) Cooperation with provincial social dialogue councils, in particular with regard to initiating programmes and partnerships for employment growth and labour market development.
- 10 a. Before issuing an opinion on the legitimacy of education in a given profession in accordance with the needs of the labour market, referred to in section 5.5, the voivodship labour market council may consult the district labour market council.
- 10 b. The provincial labour market council shall issue an opinion on the legitimacy of education in a given occupation in accordance with the needs of the labour market, referred to in paragraph 5.5, after reviewing the forecast of demand for employees in the occupations of vocational education in the national and provincial labour market referred to in Article 46b of the Act of 14 December 2016. – Education Law.
- 10 c. The opinion on the appropriateness of training in a given profession in accordance with the needs of the labour market, referred to in paragraph 5.5, shall be issued for 5 years, subject to Article 68.7b of the Act of 14 December 2016. – Education Law.

### **Needs planning for the IT and electrical professions using the example of the District Labour Market Council.**

The scope of action of the District Labour Market Council includes, in particular:

1. to inspire undertakings aimed at full and productive employment in the district,
2. assessing the rationality of the management of Labour Fund resources,
3. to give an opinion on the criteria for the distribution of Labour Fund resources for financing employment promotion programmes and financing other optional tasks and to give an opinion on proposals developed by county labour offices for the allocation of Labour Fund

resources at the disposal of county government and on reports on their use,

4. to make proposals and give opinions on matters relating to the direction of education, vocational training and employment in the district,
5. to assess periodic reports on the activities of the district labour offices and to present periodic reports and proposals on employment matters,
6. delegation of representatives to the competition committee selecting a candidate for the post of director of the district labour office,
7. giving an opinion on proposals for the dismissal of the director of the district labour office,
8. giving an opinion on the advisability of special programmes,
9. to give an opinion on changes in the implementation of special programmes proposed by the Governor,
10. giving an opinion on the advisability of implementing the Activation and Integration Programme.

## **THE ASSOCIATION OF CRAFTS**

**The National Branch Commissions** act as the representative of the crafts community in their respective branches. They aim to support artisans by:

- the dissemination of modern technology and innovation,
- further training and qualification development,
- presenting the views of the industries on issues of importance to them,
- shaping pro-social attitudes and promoting professional ethics.

**The Board of Directors appoints branch committees.**

- Polish National Goldsmiths' and Jewellers' Branch Commission of the Polish Craft Association,

- Polish National Hairdressing and Cosmetics Trade Commission of the Polish Crafts Association,
- All-Poland Photographers' Branch Committee of the Polish Crafts Association,
- National Commission of Building Crafts and Building Material Manufacturers of the Polish Craft Association,
- All-Poland Artistic Crafts Commission of the Polish Crafts Association,
- Polish National Commission of Bioenergotherapists and Radiesthesiologists of the Polish Crafts Association,
- All-Poland Automotive Crafts Commission of the Polish Craft Association,
- Polish National Commission of Tailors and Clothing and Textile Crafts of the Polish Craft Association,
- Polish National Association of Food Crafts Branch Committee,
- Polish National Chamber of Chimney Sweeps of the Polish Craft Association.

## **Summary**

The digital and energy transformation requires a new approach to vocational education (VET) and the adaptation of vocational skills and qualifications in key sectors of the economy. In Poland, the vocational education system is based on legal regulations, such as the Constitution of the Republic of Poland, the Education System Act, the Education Law Act and regulations of the Minister of National Education. These indicate the formal nature of the education process, and any changes to the system require legal regulations.

Within VET, training in the IT and electrical professions plays an important role. In order to adapt education to the dynamically changing needs of the labour market, new professions and qualifications are being

introduced, such as electromobility technician. The process of ecological and digital transformation necessitates the adaptation of core curricula, teaching content, and practical preparation for students for the professions of the future.

Good examples of effective implementation of the VET education system are projects carried out as part of international cooperation, such as 'Vocational Compass', 'Recognition and Use of Good Practice' or 'Comprehensive Development Programme of the Lomza Academy of Fine Arts'. These projects contribute to increasing the attractiveness of vocational education, disseminating good practices and increasing interest in VET courses, including the professions of IT and electrical engineering.

Cooperation between businesses and vocational schools is a key element of practical training. An example is the cooperation between TARGOR TRACK and the Vocational School Complex No. 1 in Ostroleka. This cooperation includes, among other things, the organisation of internships, apprenticeships, support for educational infrastructure and the inclusion of company employees in the teaching process. This type of cooperation enables schools to access modern technologies and solutions implemented in companies, which increases the quality of education and the attractiveness of the schools' educational offerings.

Both provincial and district labour market councils play an important role in shaping vocational education provision. By giving opinions on the directions of education and monitoring the needs of the labour market, they support the development of vocational education and define the directions for the development of vocational schools.

The European Year of Skills 2023 highlights the importance of vocational education in developing the skills needed to realise green and digital transformation. The initiative aims to align education and training systems with the needs of the labour market and provide people with lifelong skills upgrading opportunities.

## Conclusions

1. Aligning the education on offer with the needs of the labour market:
  - Cooperation between vocational schools and employers, such as TARGOR TRACK, enables students to be trained according to current labour market needs.
  - The introduction of new qualifications, such as electromobility technician, shows that it is necessary to take market and technological changes into account in vocational training.
2. Increasing the attractiveness of vocational education (VET):
  - Educational programmes such as 'Vocational Compass', 'Recognition and Use of Good Practice' and 'Comprehensive Programme for the Development of the Lomza Academy of Fine Arts' contribute to popularising vocational training and improving its image among young people and their parents.
  - Promoting a dual education system based on cooperation between schools and employers is an effective way to raise the profile of vocational education and increase interest in VET courses.
3. Developing cooperation with employers:
  - Companies such as TARGOR TRACK can be active partners of vocational schools, supporting the education of students in the practical aspect of the profession.
  - Including employers in the education process through study visits, workshops, and work placements allows students to gain valuable work experience.
4. Cooperation with labour market institutions:
  - The provincial and district labour market councils play an important role in defining education courses and giving their opinion on the relevance of their courses. Thanks to their involvement, it is possible to adapt the educational offer to the needs of the labour market.

## 5. Implementation of EU policies on vocational training:

- The European Year of Skills 2023 highlights the importance of vocational education in the digital and green transformation. It is crucial to prepare the education system for these changes to enable students to acquire the necessary skills.

### Recommendations:

- Continue cooperation between vocational schools and employers to create better conditions for practical vocational training.
- Increasing the attractiveness of VET education by promoting its advantages at the primary school level.
- Developing international cooperation for the exchange of good practice and mutual learning in the context of dual education systems.
- Strengthening the role of labour market institutions in planning and giving opinions on vocational training courses.

Digital and ecological transformation is an inevitable process, and the cooperation of schools, employers, and labour market institutions is crucial to ensure that skilled human resources meet the demands of the labour market.

## **Conclusions and recommendations**

The relevance of the topic of the project implemented by an international partnership with OTN (PL), FAV (DE) and EPKA (GR) stems from the lack of linkage and implementation tools between EU transformation policies and the need for qualified human resources, especially in the areas of electricity and IT capable of implementing transformation-related technological change in the economy.

The above problem is due to the fact that vocational training is excluded under the Treaty on the Functioning of the European Union (OJ 2004.90.864/2) and is not harmonised under EU competence.



This is enshrined in Article 165: 'Support for the development of education and sporting ventures.

The Union shall contribute to the development of quality education by encouraging cooperation between the Member States and, if necessary, by supporting and supplementing their action while fully respecting the responsibility of the Member States for the content of teaching and the organisation of education systems and their cultural and linguistic diversity." This is in line with the principle of subsidiarity, which states that each Member State is fully responsible for the content of teaching and the organisation of education and training systems.

The project assessed the possibilities of orienting VET education towards the professions of the future, i.e. electrician and computer scientist, within the formal education systems in the partner countries.

The analysis of the thematic material developed by the partners shows that the education systems, including VET education, are different and distinct.

In general, each country has a centralised system with central authorities responsible for education policy and local authorities/offices responsible for overseeing the proper work of the education system in their area and the implementation of pedagogical supervision of the system's schools.

**In the case of professions not regulated in Poland, the decision to employ an employee with qualifications obtained in another EU Member State is up to the employer.**

Directive 2013/55/EU amending Directive 2005/36/EC on the recognition of professional qualifications and Regulation (EU) No 1024/2012 on administrative cooperation through the Internal Market Information System.

A European professional card would have the added value of strengthening the internal market and promoting the free movement of professionals while ensuring more efficient and transparent recognition of professional qualifications. In particular, the card would be useful to facilitate temporary mobility and recognition under the automatic

recognition system, as well as to promote a simplified recognition process under the general system. The objective of the European professional card is to simplify the recognition process and ensure cost and operational efficiencies for the benefit of professionals and competent authorities. The introduction of the European professional card should take into account the views of the profession concerned and be preceded by an assessment of its suitability for the profession and an impact assessment for the Member States. If necessary, this assessment should be carried out jointly with the Member States. The European Professional Card should be issued upon request of the professional, upon presentation of the necessary documents, and following the related verification procedures by the competent authorities. Where a European Professional Card is issued for the purpose of pursuing professional activities on a permanent basis, it should constitute a recognition decision and be treated like any other recognition decision under Directive 2005/36/EC. It should complement rather than replace any registration requirements for access to a specific profession. There is no need to introduce a European Professional Card for the legal professions for which professional cards are already used under the regime provided for by Council Directive 77/249/EEC of 22 March 1977 to facilitate the effective exercise by lawyers of freedom to provide services<sup>6</sup> and Directive 98/5/EC of the European Parliament and of the Council of 16 February 1998 to facilitate practice of the profession of lawyer on a permanent basis in a Member State other than that in which the qualification was obtained<sup>7</sup>.

Recognition of diplomas for professional purposes is a more complicated process, as it must take into account not only the requirements of the education system (universities and professional schools) but also the qualification standards adopted by economic and professional organisations and the legal regulations for the practice of particularly important and responsible professions (the so-called legally regulated professions).

Thus, the education system in Poland includes public and non-public kindergartens, primary schools, post-primary schools, post-secondary schools, art schools, special schools and care and educational institutions (excluding nurseries, children's clubs, correctional institutions and higher

education institutions). The minister responsible for education and upbringing (from 1 January 2024, the Ministry of Education and Science) is responsible for education management at the national level. By means of regulations, the minister regulates, among other things:

- core curricula for pre-school education, general education, vocational education and framework teaching plans,
- classification of occupations for vocational education,
- the conditions and procedure for authorising textbooks for school use,

The structure of secondary vocational education (ISCED 3) includes:

- 5-year technical school;
- 3-year vocational upper secondary school;
- 2-year vocational upper secondary school;
- 3-year special preparatory school;
- post-secondary school.

Professional competence is confirmed by qualification examinations conducted by the state Regional Examination Boards.

In Greece, the central authority in all areas and levels of the education system is the Ministry of Education and Religious Affairs. It is tasked with setting the long-term goals of the Greek education system developing the content of the curricula. Curricula are developed and implemented at the national level for all schools at all levels of education.

At the regional level, 13 Education Directorates oversee the implementation of national education policy. At the local level, 54 Directorates of Primary and Secondary Education provide direct supervision. School principals administratively manage the work of the teachers and organise in-service training. After completing the first cycle, it is possible to enter a general or vocational upper secondary school.

## Types of training

<p><i>Geniko Lykeio</i> – G.L. (upper secondary school, upper secondary school)  <i>Geniko Lykeio</i> offers general/academic type education and</p>	<p>Age: 15-18</p>
<p><i>Epangelmatiko Lykeio</i> – EPA.L. (technical vocational school, technical college)  <i>Epangelmatiko Lykeio</i> offers general education and technical-vocational education in a 2-year cycle organised by professional fields</p>	<p>Age: 15-18</p>
<p><i>Epangelmatikes Scholes</i> – EPA.S (vocational school)</p>	<p>Age: 16-18</p>

Graduates of *Epangelmatiko Lykeio* receive high school graduation certificates and a vocational training certificate at level three (*Ptychio Epangelmatikis Ekpaidefsis, epipedou 3*) based on the results of examinations held in schools tested by external examiners.

In Greece, professional qualification documents vary according to the level of education and the institutions completed. Here are the main types of documents:

- 1. Diploma of Secondary Vocational Education (EPAL):** Students graduating from a secondary vocational school are awarded a vocational specialisation diploma at Hellenic Qualification Framework (HQF) level 4, known as "Πτυχίο Επαγγελματικής Εκπαίδευσης και Κατάρτισης, Επιπέδου 4" (Ptychio of Vocational Education and Training at HQF level 4).
- 2. Higher education diploma (AED):** Graduates of public and private universities are awarded an AEI diploma, which is recognised as equivalent to a bachelor's or master's degree, depending on the programme of study.
- 3. Institute of Vocational Education (IEK) Graduate Certificate:** IEK graduates are awarded a Certificate of Vocational Education,

which can be recognised as equivalent to a Level 5 HQF diploma after passing accreditation examinations.

4. **Vocational School Leaving Certificate (EPAS):** Students graduating from a vocational school are awarded a Certificate of Vocational Education at HQF level 3, known as "Πτυχίο Επαγγελματικής Εκπαίδευσης και Κατάρτισης, Επιπέδου 3" (Ptychio of Vocational Education and Training at HQF level 3).
5. **Vocational School Leaving Certificate (SEK):** SEK graduates receive a Certificate of Vocational Education at HQF Level 3.
6. **School of Advanced Vocational Education Certificate (SAEK):** SAEK graduates are awarded the Diploma of Vocational Education at HQF Level 5.
7. **Professional Education Graduation Certificate (PEPAS):** PEPAS graduates receive a Certificate of Vocational Education at HQF Level 5.
8. **Certificate of Vocational Education and Training (ESK):** Graduates of the ECC receive a Certificate of Vocational Education at HQF Level 3.
9. **Centre Laboratory (EK) Certificate of Completion:** EK graduates receive an HQF Level 3 Certificate of Professional Education.

All these documents are issued by the relevant educational institutions and are recognised in Greece as official proof of professional qualifications.

In Germany, general questions concerning vocational training policy are dealt with by the Federal Ministry of Education and Research (BMBF), with a coordinating and steering function for all learned professions.

The Länder implement the school-based part of vocational training and establishes vocational training committees with representatives of employers and employees. The Länder ministries cooperate to ensure uniformity and comparability of vocational training in the form of the Standing Conference of Ministers.

The Vocational Training Act (Berufsbildungsgesetz, BBiG) will provide companies with the freedom to train specialists in dual training and introduces the responsibility of the Chambers of Industry and Commerce for quality assurance in workplace training. Thus alongside schools and businesses, the chambers are the third pillar of the German vocational training system.

Vocational education begins at the upper secondary level. Pathways to vocational qualifications:

- secondary vocational education,
- dual system training.

An important role of the Chambers is:

- identifying the need for changes in the qualification requirements of the economy and making adjustments to the training regulations,
- organisation of intermediate and final examinations (appointment of examination boards with representatives of employers, employees and vocational school teachers).

• **Vocational certificates** – On completion of vocational training, those gaining qualifications within the dual system (vocational school + apprenticeship/traineeship) receive a so-called *Gesellenbrief* (for artisans) or *Facharbeiterbrief* (for other professions). These documents are equivalent to vocational training diplomas.

• **Certificates of completion of vocational courses** – If someone has completed a vocational course or specialised training, a certificate issued by the organisation providing the course is proof of qualification.

• **Certificate of recognition of professional qualifications** (*Anerkennung der Berufsqualifikation*) – If a person has acquired a professional qualification outside Germany, he or she can apply for formal recognition of his or her qualification by the relevant German institution (e.g. *Zentrale Stelle für die Anerkennung ausländischer Berufsqualifikationen*). Such recognition is granted on the basis of a comparative assessment between the qualifications obtained abroad and German standards.

**Table 1. Comparative overview of education systems**

<b>Comparison area</b>	
<b>1. The body responsible for the education system in the state</b>	
<b>Greece</b>	Ministry of Education and Religion
<b>Germany</b>	Federal Ministry of Education and Research (BMBF)
<b>Poland</b>	Ministry of Education and Science
<b>Terms of reference</b>	
<b>Greece</b>	Setting long-term goals for the Greek education system, developing curriculum content.
<b>Germany</b>	The BMBF has a coordinating and steering function for all learned professions.
<b>Poland</b>	It defines the core curricula for preschool education, general education, vocational education and framework teaching plans, <ul style="list-style-type: none"> <li>– classification of occupations vocational education,</li> <li>– the conditions and procedure for authorising textbooks for school use,</li> </ul>
<b>2. Decentralisation of authority</b>	
<b>Greece</b>	Not applicable
<b>Germany</b>	– Land ministries of education, vocational training commissions appointed by the Länder
<b>Poland</b>	Not applicable
<b>3. Organisation of supervision of the education system</b>	
<b>Greece</b>	Regional level: 13 Education Directorates. Local level: 54 directorates of primary and secondary education
<b>Germany</b>	Land level: Chambers of Industry and Commerce (IHK) and Chambers of Crafts (HWK) responsible for supervising the practical part of vocational training.

<b>Poland</b>	16 school superintendents exercise tasks and powers in the field of education, including pedagogical supervision and evaluation of educational institutions on behalf of the Governor
<b>Compulsory schooling</b>	
<b>Greece</b>	The compulsory period lasts 11 years and covers children aged 4 to 15 years of age and begins as a 2-year compulsory preschool education for children aged 4 and 5 in kindergarten
<b>Germany</b>	Compulsory education lasts until the age of 18 and starts from the age of 6, with primary school
<b>Poland</b>	Compulsory education lasts until the age of 18 and starts at the beginning of the school year in the calendar year in which the child turns 7 years old
<b>4. General education and vocational education – pathway</b>	
<b>Greece</b>	<ul style="list-style-type: none"> <li>– 6-year primary school (Dimotiko Scholeio) – 3-year lower secondary school (Gymnasio) with vocational orientation</li> <li>– 3-year general secondary school (Geniko Lykeio) with vocational orientation</li> <li>– 3-year vocational secondary school (Epaggelmatiko Lykeio) with vocational orientation</li> <li>– 3-year upper secondary school (Geniko Lykeio) with a technical vocational school, technical college (Epaggelmatiko Lykeio – EPA.L.)</li> <li>– Vocational school with a breakdown into vocational areas and courses in the form of workshops. (Epaggelmatikes Scholes – EPA.S)</li> <li>– vocational schools run by ministries in professions related to their ministry.</li> </ul>



<b>Germany</b>	<ul style="list-style-type: none"> <li>– 4-year primary school (6 years in Brandenburg and Berlin)</li> <li>– Junior high school graduation exam</li> <li>– Realschule leading to a diploma entitling the holder to pursue a vocational qualification, undertake an apprenticeship or transfer to a secondary school</li> <li>– general Hauptschule with the possibility of continuing vocational training or continuing vocational qualification</li> <li>– Berufsschule as vocational schools for realschule and hauptschule students,</li> </ul>
<b>Poland</b>	<ul style="list-style-type: none"> <li>– 8-year-old primary school</li> <li>– 4-year general secondary school</li> <li>– 5-year technical school – 3-year vocational upper secondary school</li> <li>– 2-year vocational upper secondary school</li> <li>– 3-year preparatory special school</li> <li>– post-secondary school where you can obtain secondary education, the title of technician and qualifications in the chosen profession.</li> </ul>
<b>5. Vocational training</b>	
<b>Greece</b>	<p>It is implemented in vocational schools (Epanagmatiko lykeio) (vocational.) – cycle at upper secondary level,</p> <ul style="list-style-type: none"> <li>– an optional post-secondary cycle, the so-called apprenticeship class.</li> </ul>
<b>Germany</b>	<p>It starts at the upper secondary level with the possibility of training:</p> <ul style="list-style-type: none"> <li>– in a secondary vocational school,</li> <li>– in the dual system.</li> </ul>
<b>Poland</b>	<p>From 2017, vocational training starts after the completion of the eighth grade of primary school (ISCED 1 and ISCED 2 stages) in:</p> <ul style="list-style-type: none"> <li>– lower secondary vocational school,</li> <li>– upper secondary vocational school (continuing education),</li> <li>– high school</li> <li>– 3-year special preparatory schools for employment</li> <li>– post-secondary schools</li> </ul>

<b>6. Structure of vocational training</b>	
<b>Greece</b>	<ul style="list-style-type: none"> <li>– Vocational schools (epagelmatiko lykeio, ΕΠΙΑΛ) of 3 years combine general and vocational education, allow you to gain practical qualifications,</li> <li>– Institutes for Vocational Education (IEK) provides 2-year programmes for middle and high school graduates; the programmes focus on practical vocational skills and are tailored to the needs of the labour market</li> <li>– Vocational schools (EPAS) 2 years for students graduating from secondary school with a vocational qualification programme.</li> </ul>
<b>Germany</b>	<ul style="list-style-type: none"> <li>– a vocational school provides vocational training in one or more regulated professions or leads to full vocational qualifications in a specific profession</li> <li>– secondary technical school leads to qualifications for higher education.</li> <li>– a vocational secondary school (in some Länder) allows students who have followed the dual system to access higher education and ends with the matriculation examination.</li> </ul>
<b>Poland</b>	<ol style="list-style-type: none"> <li>1. industry lower secondary schools (3 years), allow to obtain professional qualifications after passing the exam confirming the qualification in the given profession</li> <li>2. industry upper secondary schools (2 years) providing education in a profession in which a qualification common to the profession taught has been identified, graduates will be able to take the upper secondary school leaving exam giving access to studies</li> </ol>

<b>7. Official documents confirming the professional training obtained</b>	
<b>Greece</b>	<ul style="list-style-type: none"> <li>– Diploma of secondary vocational education (EPAL in vocational specialisation at level 4 of the Hellenic Qualification Framework (HQF),</li> <li>– Certificate of Training vocational equivalent to HQF Level 5 Diploma</li> <li>– HQF Level 3 Certificate of Vocational Education (SEK or EPAS)</li> </ul>
<b>Germany</b>	<p>A document certifying that the person concerned has completed secondary education and is eligible to study at university level</p> <ul style="list-style-type: none"> <li>– Professional qualification certificates Gesellenbrief (craftsmen), Facharbeiterbrief (other professions) Berufsschulabschluss (completion of vocational school) obtained under the dual system equivalent to vocational training diplomas</li> <li>– Certificates of completion of professional courses or specialised training are issued by the course provider and confirm qualifications</li> </ul>
<b>Poland</b>	<ul style="list-style-type: none"> <li>– School certificates of completion of an upper secondary school + vocational diploma in the occupation taught</li> <li>– school certificates of completion upper secondary school + vocational diploma</li> <li>– school certificates of completion of a technical school + vocational diploma in the occupation taught</li> <li>– journeyman's certificate of professional competence</li> </ul>

## 9. Organisation of examinations

<b>Greece</b>	<p>Vocational examinations are organised by different institutions depending on the type of profession and training system.</p> <ul style="list-style-type: none"> <li>– The Chambers of Commerce (EBE) and Crafts (EPE) also oversee the certification and recognition of professional qualifications in these fields.</li> <li>– Institutes of Vocational Training (IEK)</li> </ul> <p>Responsible for professional examinations after courses</p> <ul style="list-style-type: none"> <li>– Organisation of Occupational Qualifications (OEK) organises examinations in vocational areas, including vocational training. OEK develops and conducts vocational examinations in various economic sectors, which are mandatory for certification in many professions.</li> <li>– Upon completion of the four-semester curriculum and an internship or work placement, graduates receive a Certificate of Vocational Training</li> <li>– as part of the National Accreditation Examinations at examination centres run by the National Organisation for the Certification of Professional Qualifications and Guidance (EOPPEP).</li> </ul> <p>It is possible to obtain Diploma in Vocational Education and Training</p>
<b>Germany</b>	<p>The examinations are organised by the IHK or HWK (the respective chambers of commerce) and lead to the title of Geselle (in the trades) or Facharbeiter (in other trades).</p> <p>Conducting examinations includes:</p> <ul style="list-style-type: none"> <li>– Intermediate examination (Zwischenprüfung): in the middle of vocational training</li> <li>– Final examination (Abschlussprüfung) consisting of a written and a practical part.</li> </ul> <p>The committee consists of:</p> <ul style="list-style-type: none"> <li>– an examiner with relevant qualifications and experience in the profession,</li> <li>– employer as representative of the work placement</li> <li>– the teacher as representative of the pupil's school of theoretical education</li> </ul>

	<ul style="list-style-type: none"> <li>– a representative of the Chamber of Crafts/Industry and Commerce.</li> </ul>
<b>Poland</b>	<ul style="list-style-type: none"> <li>– The Central Examination Board is responsible for preparation and setting of examination materials, in particular examination tasks and examination sheets for the eighth grade examination, matriculation examination, vocational examination and extramural examinations</li> <li>– 8 District Examination Boards responsible for preparing and organising the external evaluation system</li> <li>– the examiners are responsible for the proper conduct of the qualification or vocational tests, checking and grading the papers in accordance with the grading rules received for the solutions.</li> </ul> <p>Examinations organised by the Chambers of Crafts (for young workers)</p> <p>The qualification examination consists of two parts: a written part and a practical part on an examination stand</p> <p>Students are eligible to take the examination:</p> <ul style="list-style-type: none"> <li>– branch schools,</li> <li>technical schools, post-secondary schools,</li> </ul> <p>The examination for the title of journeyman or master functions in the same way.</p>

Summarising the results of the team's work and elaborating on the study entitled. "Attractiveness of the professions of the future INFORMATICIAN and ELECTRICIAN and the importance of VET education in the context of EU challenges – Study with conclusions and recommendations for adaptation and integration of learned experiences, solutions, good practices on the examples of Germany, Greece and Poland".

We can formulate the following conclusions:

1. in Greece, Germany and Poland, there are national arrangements for schooling and general and vocational education,
2. the differences concern the structure of schooling, where career counselling or the start of vocational training takes place in incomparable structures,
3. the paths to vocational training in a profession vary from country to country and comparatively between minis,
4. a separate issue is the comparability of professions and professional titles obtained in the various countries, as well as the compatibility of professions in the education system and the system of the list of professions in the country,
  - Poland has a Classification of Occupations and Specialities (the Ministry of National Education is responsible) developed on the basis of the International Standard Classification of Occupations ISCO-08, which is not the same as the list of school occupations and specialities (the Ministry of Family and Social Policy is responsible). There are approximately 2,500 occupations and specialities. Changes and their updating in accordance with the labour market are introduced by means of regulations
  - in Greece, the list of professions is defined by the National Organisation for the Certification of Professional Qualifications and Guidance (EOPPEP), which is responsible for developing and updating national professional qualification standards and for certification of professional competencies. Sectoral Qualification Standards are in place, which define the required competencies, skills and knowledge for each profession,
  - In Germany, the official list of occupations is determined by the Klassifikation der Berufe 2010 (KldB 2010), compiled by the Federal Employment Agency.

Structure of KldB 2010:

- Main groups (Hauptgruppen): 10 categories covering broad professional areas,
- Professional groups (Berufsgruppen): 37 subcategories within the main groups.
- Sub-professional groups (Berufsgattungen): 144 further subdivisions.
- Occupations (Berufe): 1,286 detailed occupations.

KldB 2010 is regularly updated to reflect changes in the labour market and the emergence of new occupations.

5. A system of examination and certification of professional competence is individualised in each country. There is difficulty in comparing occupations and professional competencies obtained after completing the Generally, in each country:
  1. there is a public institution within the scope of competence is the creation of educational policy, the development of principles and tools of this policy, substantive and evaluative supervision of the implementation of educational tasks by educational institutions,
  2. within the public structures responsible for education policy and its implementation, there are bodies representing the social side – above all, representations of employers (unions, associations, chambers, etc.) as bodies for consultation and proposals on the content and need for change, particularly in VET education,
  3. the EU's transformational policy creates a general framework to be implemented at the national level.

National strategic documents (Poland), for example, include:

- Poland's Energy Policy until 2040 (PEP2040).
- National Energy and Climate Plan 2021-2030 (NERP).
- National Reconstruction Plan (NRP).

- Strategy for Responsible Development (SOR).
- Green Transformation Charter.

At this level, the documents integrate environmental objectives with economic and social development.

Involvement of the educational system (e.g. new professions and specialisations, adaptation/changes/updating of educational documents (core curricula, fields of study, vocational subjects) are implemented in an ongoing or anticipatory manner through the introduction of new professions:

- Directions related to RES,
- Energy efficiency training,
- Education in the field of sustainable construction,
- Directions related to the circular economy (GOZ),
- Organic agriculture and agro-ecology,
- ESG training.

Thus, indirectly, at the national level, there is a "shift" of VET education to new areas corresponding to transformational change as well as at the direct school level as initiatives for linking VET to practice, the use of ERASMUS+ to expand professional competencies in high-tech areas, student development activities within, e.g. extra-curricular activities (interest circles).

Analogous developments can be observed in Germany, where the changes are supported by a functioning dual education system, resulting in a faster adaptation of curricula to the needs of the labour market in the context of the green transition.

The green transformation in Germany is therefore leading to an evolution of VET education, i.e. introducing new professions, updating curricula and educational materials and promoting lifelong learning to meet the demands of a sustainable economy. An interesting tool for VET education to keep up with the needs of change and transformation is the education



system itself and the linkage of this education in the triangle of entrepreneur-trade/industrial/craftsmen's association-public institutions.

In the case of Greece, the green transition analogously leads to the evolution of education.

With an emphasis on lifelong learning, offering upskilling programmes in areas related to the green economy. An interesting tool is a system of financial incentives to motivate the choice of VET education.

## **Recommendations and conclusions**

### **Recommendations**

1. Strengthening cooperation with the private sector and businesses:
  - Create partnerships with businesses: Involve businesses in collaborating on curriculum development and introduce compulsory work placements to provide practical work preparation.
  - Adaptation of education to the real needs of the labour market: Regular consultation with employers in order to keep the content of education updated in line with labour market requirements.
  - Enabling mentoring programmes: Encourage IT and electrical professionals to act as mentors for VET students.
  
2. Promoting the attractiveness of the electrical and IT professions:
  - Campaigns to promote the professions of the future: Organisation of media and information campaigns showcasing employment opportunities, stability and career paths in the IT and electrical professions.
  - Organisation of open days and study visits to schools: Student visits to IT and electrical companies, including participation in vocational school open days.
  - Demonstrate the 'green' and modern aspects of the professions: Highlighting the role of the electrical and IT professions in green transformation and digitalisation, which can increase the attractiveness of these professions among young people.
  
3. Upgrading curricula and educational infrastructure:
  - VET curriculum update: Integrating the latest technological trends such as renewable energy, smart home, Internet of Things (IoT) and cyber security.

- Development of digital skills and green competencies: Introduce knowledge related to digitalisation (e.g. artificial intelligence, data analysis) and 'green' competencies (e.g. renewable energy, energy-efficient construction) into education curricula.
- Development of educational infrastructure: Modernisation of training laboratories, introduction of simulators and other modern teaching tools that replicate the real working environment.
- 4. introduction of innovative education methods
- Dual education models: Combining theoretical and practical learning in a real work environment. Schools can collaborate with local businesses to offer students learning directly in the workplace.
- Development of e-learning and remote education systems: The use of learning platforms to enable the acquisition of theoretical knowledge in a flexible manner.
- Creation of certification systems for professional competencies: Introduce certification of professional skills with national and international recognition.
- 5. financial and motivational support for students and teachers
- Financial support for students: Scholarships, awards or educational vouchers for VET students to motivate them to enter these professions.
- Training and professional development for teachers: teachers should participate in training programmes and workshops to better adapt educational content to new labour market requirements.
- Bonuses and gratuities for teachers: Introduction of an incentive system for teachers who participate in in-service training and implement innovative educational methods.

## Conclusions

1. The importance of the electrical and IT professions in the context of the green and digital transformation:
  - Professions of the future: Electricians and IT are key professions for the implementation of the European Green Deal and the digital transformation. Competence in these areas is essential for the implementation of renewable energy technologies, smart homes and cyber security.
  - Job stability: The demand for professionals in these professions is increasing due to the implementation of new regulations on climate neutrality and digital transformation in companies.
2. Insufficient number of specialists:
  - Staffing gaps: There is a shortage of IT and electrical specialists in Poland, Germany and Greece. This problem threatens the implementation of key digitisation and energy projects.
  - Demand for VET professionals: Electrical and IT professions are key to the digital and energy transformation, so urgent action is needed to increase the number of students entering these fields.
3. The need to implement modern educational methods and teaching tools:
  - Changing competencies: New skills related to smart homes, smart grids, robotics and automation of production processes need to be implemented.
  - Dual training: The dual model (schooling + work experience with an employer) is an effective way of training that allows for the acquisition of practical competencies already during the education phase.
  - VR/AR technologies and simulators: The implementation of modern learning tools in the form of simulators and virtual reality (VR) technologies will increase the effectiveness of teaching in the areas of IT and electrical engineering.

4. The need to change the image of vocational training:

- Increase the prestige of vocational education: The stereotype of vocational education as an inferior form of education needs to be disenchanting. It is necessary to emphasise that the electrical and IT professions are well-paid, stable and offer extensive career opportunities.
- Increasing public awareness: Public campaigns should be organised to show that vocational training is not only an alternative to studies but also an opportunity for stable and well-paid employment.

In conclusion, the promotion of VET education in the electrical and IT professions is a key element in the implementation of the Green Deal policy and the digital transformation in the EU. The introduction of dual programmes, the modernisation of the educational infrastructure, the increase of cooperation with the private sector and the change of the perception of VET professions in society are key actions to be implemented at the national and international levels.

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