

#### **ENERGY LITERACY-PRACTICAL TRAININGS FOR SUSTAINABLE ENERGY CONSUMPTION VIA PERSONAL BEHAVIOURAL CHANGES**

















This Project has been funded by Erasmus+ under the action KA220-ADU - Cooperation partnerships in adult education and as described in the project proposal 2021-1-PL01-KA220-ADU-000033582.

Project title: Energy literacy-practical trainings for sustainable energy consumption via personal behavioural changes

Project duration: 1. 2. 2022 - 31. 1. 2024

This publication reflects the views only of the authors and contributors, and the Commission cannot be held responsible for any use, which may be made of the information contained therein.

The Association of Municipalities Polish Network "Energie Cités", Kraków, Poland INNOVATION HIVE, Larissa, Greece International Institute for the Implementation of Sustainable Development, Maribor, Slovenia North-West Croatia Regional Energy Agency, Zagreb, Croatia LEVILO - Association for ecological and social sustainability, Graz, Austria The Energy Agency of Savinjska, Šaleška and Koroška region, Velenje, Slovenia













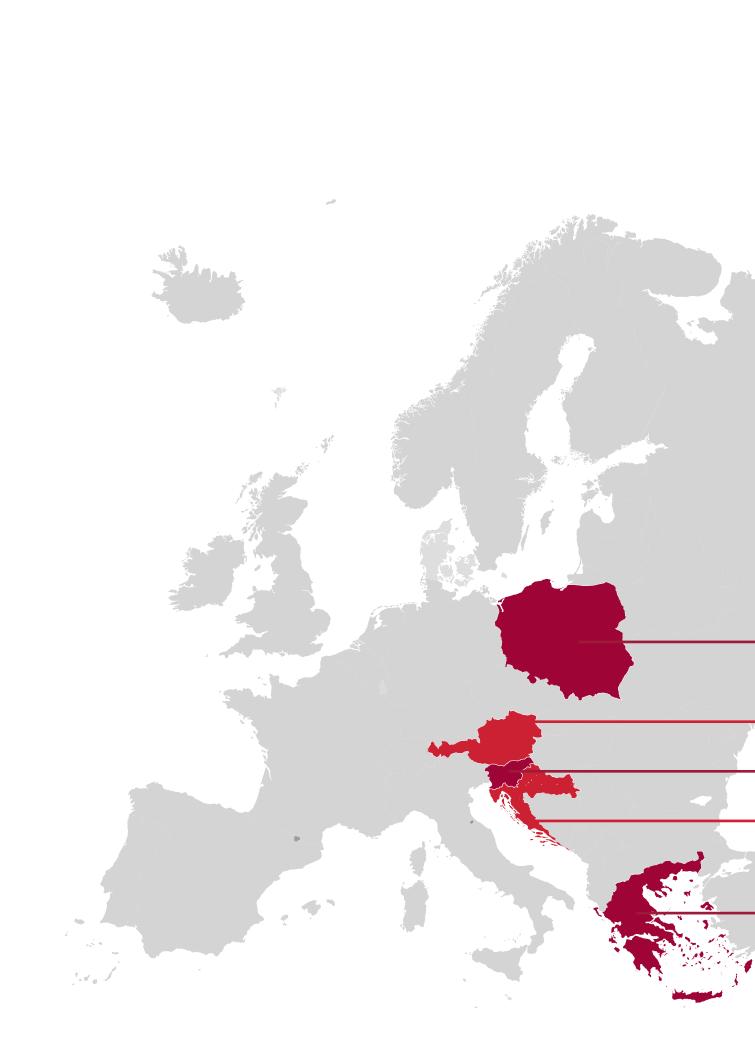






### CONTENT

1	INTRODUCTION	7
2	METHODS AND APPROACHES	9
3	RESULTS	13
4	AUSTRIA	14
4.1	Introduction	
4.2	Legal Framework	
4.3	Main goals and methodology	
4.4	Educational offers	
4.5	ldentifying gaps	
5	CROATIA	26
5.1	Introduction	
5.2	Legal Framework	
5.3	Main goals and methodology	
5.4	Educational offers	
5.5	ldentifying gaps	
6	GREECE	38
6.1	Introduction	
6.2	Legal Framework	
6.3	Main goals and methodology	
6.4	Educational offers	
6.5	ldentifying gaps	
7	POLAND	50
7.1	Introduction	
7.2	Legal Framework	
7.3	Main goals and methodology	
7.4	Educational offers	
7.5	Identifying gaps	
7.6	Annexes	
8	SLOVENIA	62
8.1	Introduction	
8.2	Legal framework	
8.3	Main goals and methodology	
8.4	Educational offers	
8.5	Identifying gaps	
9	HIGHLIGHTS	77



# TABLES & FIGURES

**Table 1:.** Guidelines/methodology for preparing a national-state-of-the-art reports

**Table 2:** EUREM Modules

**Table 3:** Basic course for energy consultants

Table 4: Adult education categories as to knowledge and recognition

**POLAND** 

**AUSTRIA** 

**SLOVENIA** 

**CROATIA** 

**GREECE** 



### NTRODUCTION

Energy is an essential element of modern society for its social and economic development and is becoming increasingly important, especially when considering the well-being of people and nature and the stability and security of any country. The energy consumption can be reduced through technological improvements and innovations. Still, as several studies show, education and digitalisation also play a strategic role in improving energy efficiency and sustainable energy consumption in terms of attitudes, awareness and consciousness. It is essential to educate citizens, including in adulthood, to facilitate the process of change among individuals, introducing them to new concepts and a more sustainable way of living, with individuals acting as change agents.

knowledge and skills through a mobile-friendly platform. It targets young adults to promote positive behavioural changes related to energy and thus create a sustainable Europe we all want. The EL-Practice project aims to equip young people with competencies, skills, knowledge and confidence to take responsibility for their life choices and actively work towards a more sustainable society within EU communities.

One of the project outcomes includes the analysis of young people's competencies in the partner countries in the field of energy literacy to identify knowledge gaps. The partners developed the questionnaires, translated them into the national languages and distributed them among the young people. Based on the analysis of the competencies, the partners will make decisions about the content, the required competencies and the teaching materials, etc.



### METHODS APPROACHES

This deliverable covers the state-of-the-art analysis, as a result of a systemic, theoretical and practical elaboration of the current conditions on the project issues in the partner countries. First, the partners produced national state-of-the-art reports consisting of competences and mapping of good practises.

The partners conducted a review of educational provision on energy literacy.

This activity included a review of existing training materials, methods used, etc.

To produce national state of the art reports, partners followed the guidelines (see Table 1).

#### Table 1: Guidelines/methodology for preparing a national-state-of-the-art reports

#### METHODOLOGY FOR THE STATE-OF-THE-ART REPORTS

	Chapter name	Contents	Max number of characters	Notes
1	Introduction	General introduction of your country, and adult educational system	2,000	General introduction to your country's educational system For ADULT education Try to relate ADULT education to the energy literacy practice
2	Legal framework	Description of the legal educational framework: regional, national, municipal level	3,000	Description of the legal framework for the ADULT education, with a focus on energy literacy education in your country:  The relevant regulations and documents at the EU level of which you are aware regarding the EU competencies framework and energy literacy for adults  The relevant regulations and documents at the national level, regional, and municipal – if there are any requirements for energy literacy – maybe you have your national competencies framework for ADULTS related to energy literacy  Strategic documents on the local/regional level (educational strategies, action plan etc.) – where there will be or is mentioned the importance of energy literacy, especially for ADULTS  E.g. if you have any documents suggesting the importance of integrating energy literacy into education and training for ADULTS – please emphasise and describe such documents
3	Main goals and methodology	Indicate the main goals of your study and the methodology used	2,000	The main goals are, which need to be expanded are To identify the present conditions in your country related to energy literacy for adults and educational options for them (formal, non-formal, informal – seminars, workshops, training, projects where adults can gain competencies, etc.  To review the integration of energy literacy topics/issues into adult education (courses, topics, educational offers), are there any formal or informal learning if yes – list them and describe To identify the existing training materials regarding energy literacy in your country (which didactical methods are used for teaching, what literature, in what way the training is carried out, e.g. face-to-face, e-trainings, what materials are used, e.g. ppt, books) Methodology: Please describe your methodology of the ADULT curriculums and materials review – how did you carry out the search, and which methods and web pages were used – if you have doubts, please consult with MIITR; MIITR will also prepare a methodology text; which partners will include into their national reports

#### METHODOLOGY FOR THE STATE-OF-THE-ART REPORTS

	Chapter name	Contents	Max number of characters	Notes
4	Educational offers	Description of the ADULT energy literacy offers, curricula, competencies, educational contents, topics covered, methods, learning materials, and didactical methods (and if you find some special cases devoted to adults, please list them).		Partners should search for ADULT educational offers in the field of energy literacy. These offers can comprehend ADULT training (formal, non-formal), existing national or international projects in your country – where you have trained adults, and they have gained competencies. Then:  Describe those offers and their curriculums (topics covered)  This task covers an in-depth analysis of relevant curriculums (adults), training materials, competencies, topics and contents, learning materials and didactical methods in partner countries and identification of good practices regarding energy literacy in existing education.
5	Identifying gaps		5,000	In the reviewed cases, try to identify: Is there any synchronisation or synergies with our EL-Practice proposal? If yes – where are these synergies, and explain(look from an educational content perspective, competencies gained, and learning/teaching methods) What are the gaps at your national level in relation to the legal framework chapter above What are the gaps, and needs, that EL-Practice will fulfil for your national and regional levels? Focus on the content of the courses offered, competencies and learning, teaching methods and materials, curricula, etc. What are the actual needs of young adults in energy literacy?
6	Other information's	You can use this chapter If you want to add something that was not included in previous chapters but is important for a better understanding of your study.		If there is something we did not mention and you feel to expose it.
7	Annexes	Full text of described case studies	/	Full text of described case studies, links to the curriculums, copies of the curriculums, the content of the courses, learning methods used, etc. – it could be in national languages



# S RESULTS

This section represents the results obtained from the national state-of-the-reports.

Each further section represents one of the partners' country. The section is structured into the following subsections:

Introduction;

Legal framework related to the education;

Main goals and methodology;

Educational offers;

Project integration, and identifying gaps;

Other supporting information.







#### Introduction

4.1

In Austria, the adult educational spectrum ranges from general education, such as basic education and catching up on educational qualifications in the second educational pathway, to vocational education and training courses and university education. At the federal level, general adult education is located in the Federal Ministry of Education, Science and Research, but other ministries also oversee specific adult education agendas. At the association level, adult education is organized by the Conference of Adult Education Austria (KEBÖ), which is composed of the ten largest continuing education associations. University and non-university research institutions are other important actors in adult education. Finally, several NGOs, associations and companies are active in non-profit, and commercial adult education<sup>1</sup>.

Over the past two decades, adult education has developed into one of the largest educational sectors in Austria in terms of participation figures. However, there is also a tendency that adult and continuing education offers have so far still tended to be taken up by people who have the corresponding financial means and access to education. In other words, the higher the level of education already available, the more likely it is that people will participate in continuing education offerings. In order to give a broader section of the population access to continuing education measures, adult-oriented educational opportunities are essential and financial support is provided by the federal, state, and local governments<sup>2</sup>. Overall, however, it is still true that the higher the level of education already possessed, the more likely it is that people will continue to participate in continuing education events. The fact is that 70-80% of the population in Austria does not participate in continuing education<sup>3</sup>. Not only is adult education becoming more important, but energy skills are becoming increasingly important in work and everyday life, as well. "In order to be able to shape our future in a climate-friendly way, we have to start early in promoting awareness and interest," says Climate Protection Minister Leonore Gewessler. The goal, she said, is to make Austria a pioneer in climate and energy literacy.

<sup>1</sup> https://www.bmbwf.gv.at/Themen/eb.html

<sup>2</sup> https://www.bildungssystem.at/erwachsenenbildung

<sup>3</sup> https://erwachsenenbildung.at/themen/eb\_in\_oesterreich/daten\_und\_fakten/angebot\_nach-frage.php

<sup>4</sup> https://infothek.bmk.gv.at/kreativraeume-zur-klimawende-lernorte-klima-energie/

# Legal Framework

On EU level, the right to education, training, and lifelong learning is enshrined in the European Pillar of Social Rights (principle 1)5.

The EU created the Coalition "Education for Climate" which aims to create a participatory educational community to support the changes needed for a climate-neutral society. Furthermore, a resolution on the European Education Area will be launched and a new strategic framework for European cooperation in education and training ("post-ET2020") will be implemented.

On national level, Austria has one funding law explicitly related to adult education. However, educational policy and the organizational structure of adult education mean that adult teaching and learning are based on several different, legislative foundations7. In 1973, Austria committed itself for the first time to financially supporting adult education and formulated a funding law. The law was amended in 1990 and 20038. At present, adult education is supervised by the Ministry of Education. However, responsibilities in terms of content are more broadly distributed between the ministries. For example, the Federal Ministry of Economics and Labor is responsible for "in-company training" and "labor market qualifications," the Federal Ministry of Social Security and Generations for health and people with disabilities, and the Federal Ministry of Agriculture, Forestry, Environment and Water Management for topics concerning their expertises.

The "Austrian Strategy for Education for Sustainable Development", in the context of the UN Decade, is intended to support a change in awareness towards sustainability among learners, teachers, and also to network the actors. It is led by the Federal Ministry for Education, Arts and Culture (BMUKK) and the Federal Ministry of Agriculture, Forestry, Environment and Water Management (BMLFUW). The Federal Ministry of Science and Research (BMWF) accompanies the process through research and teaching. Since the European Year of Lifelong Learning, the increasing importance of nonformal education is highlighted throughout Europe. Since then, the importance of this sector has continued to grow. Education for sustainable development in the nonformal sector requires especially the competition of the best ideas, the exchange, and cross-thematic approaches. Especially the BMUKK and the Conference of Austrian Adult Education (KEBÖ) set initiatives in this field10.

https://education.ec.europa.eu/es/node/1719

<sup>6</sup> https://education-for-climate.ec.europa.eu/\_en

<sup>7</sup> https://erwachsenenbildung.at/themen/eb\_in\_oesterreich/gesetze/gesetze\_ueberblick.php

<sup>8</sup> https://erwachsenenbildung.at/themen/eb\_in\_oesterreich/gesetze/foerderungsgesetz.php http://wwwg.uni-klu.ac.at/ifeb/eb/oecd-hintergrundbericht.pdf

https://www.bmbwf.gv.at/Themen/schule/schulpraxis/ba/bine.html

Initiative Erwachsenenbildung (Initiative for Adult Education) stands for the federal-state initiative to promote basic educational qualifications for adults. The legal basis is the agreement pursuant to Art. 15a B-VG between the federal government and the Länder on the promotion of educational measures in the field of basic education as well as of educational measures for catching up on compulsory schooling. Its aim is to enable young people and adults living in Austria to acquire basic skills and educational qualifications free of charge, even after completing the school education phase, in order to open up better access opportunities to the labor market for people without sufficient minimum qualifications and to promote their social integration<sup>11</sup>.

# Main goals & methodology

Austria has a wide variety of educational offers in the field of adult learning. The main goal of this national report is the identification of the present conditions in Austria related to energy literacy for adults on the one hand and the analysis of the offered educational options for this target group. These educational options can include formal, non-formal, and informal seminars, workshops, training, and projects where adults can gain competencies. To get a better understanding of the existing education offers, a review of training materials regarding energy literacy in Austria will be conducted. This also includes a review of the didactical methods as well as the literature used in adult education concerning energy literacy. This report is also aiming to find out in what way the training is being carried out. This includes methods like face-to-face or e-trainings as well as the used materials like PowerPoint presentations or books.

To gather this information, an online research was conducted. To ensure the correctness of the facts, only certain web pages, such as web pages from the Austrian government or ministry for education, were included in the research. Many informations come from the site »www.erwachsenenbildung.at« since it is focused entirely on adult education in Austria. Another site that was used in the research is the homepage by WIFI, an Austrian institute for further and continuing education. WIFI provides a broad offer of courses, seminars and training programs in different fields and therefore some courses on the topic of energy. The google search was carried out in both English and German. Keywords included different combinations and suppresses of the words a Erwachsenenbildung.

The google search was carried out in both English and German. Keywords included different combinations and synonyms of the words »Erwachsenenbildung + Energiekompetenz + Österreich« (»Adult education + energy literacy + Austria«).

## Educational offers 4.4

#### **ENERGIE-FÜHRERSCHEIN (ENERGY LICENCE)**

4.4.1

The energie-führerschein is a training for energy competencies in the workplace and in everyday life. The target group for this additional qualification is young people and adults in training, as well as employees of companies who attach importance to climate protection and the careful use of energy.

The competencies can be attained through a seminar or in self-study with learning materials that are available for download free of charge and an app. The studied information can be reinforced with a practice quiz before taking the exam. The energie-führerschein exam is administered via the computer program Moodle. If one answers 70% of the questions correctly, one will receive the energie-führerschein certificate, the "energy license".

For leisure time, one learns about the impact of leisure activities on the environment as well as



The content of the seminar and the learning materials are structured in the following way:

#### **BASICS ENERGY**

important energy terms, forms of energy and energy conversion

#### ENERGY

For the own home, one learns the composition of energy consumption, how to measure it, calculate the energy costs, and how to read the energy bill. This is followed up by tips on how to save money on heating, hot water, and electricity.

#### WORKPLACE

HOME

CONSUMPTION

For the workplace, one learns to identify energy guzzlers and calculate consumption costs as well as energy-saving measures.

The lesson about energy consumption is structured in three different parts

#### **DURING LEISURE TIME**

about the ecological footprint and multimodal mobility<sup>12</sup>.

**ECOLOGICAL EFFECTS OF ENERGY CONSUMPTION** 

**EVERY-DAY POSSIBILITIES TO USE ENERGY SPARINGLY** 

CLIMATE PROTECTION AND RENEWABLE ENERGIES

**ENERGY-SAVING MOBILITY** 

https://www.umweltberatung.at/download/?id=energie-fuehrerschein-beschreibung-seminar-3084-umweltberatung.pdf

Additionally, a course to become an energie-führerschein coach is offered. As an energie-führerschein coach, one receives the technical and didactic know-how to conduct energie-führerschein seminars. The short course to become an energie-führerschein coach is ideal for people who work in youth or adult education or who want to work in companies as a multiplier for sustainability<sup>13</sup>.

The seminar is structured in **12 units, each lasting 50 minutes,** plus self-study and costs € **310,- per person**. This price includes training documents and the examination fee. For self-study students, the learning materials can be attained for free but the examination fee is € **35,-** <sup>14</sup>.

<sup>13</sup> https://www.energie-fuehrerschein.at/

<sup>14</sup> https://www.energie-fuehrerschein.at/mod/page/view.php?id=57

#### TRAINING FOR ENERGY OFFICERS BY WIFI

4.4.2

During the training for energy officers, skills for implementing systematic and efficient energy management in companies can be learned. In addition to content related to energy basics, one will gain insights into energy indicators, economic efficiency, and costs in energy topics.

To become an Energy Officer, one has to partake in a four-day basic training with practical work. The course is aimed at people who want to build up know-how themselves for small and medium-sized companies. The training is designed for energy and building managers, waste and environmental officers, facility managers, and persons responsible for the quality, safety, and environmental management. A basic technical understanding of energy topics and knowledge of operational processes is desirable for the training, however, basic technical training is not a prerequisite. The basic training as an energy officer comprises 48 hours, including a project work of approximately 16 hours in the own company.



#### The course consists of the following topics:

Correctly interpre	et electricity, heat, and gas bills
Fundamentals of	f energy technology
Operational ene	rgy management and energy efficiency
Legal foundatior	ns for energy efficiency
Energy and clima	ate protection
Energy data mar	nagement
Procedure for de	termining energy consumption and costs
Maintenance of	energy accounting
Ongoing monito	oring and reporting
Energy indicator	s and benchmarks
Use of renewable	e energies and combined heat and power generation
Energy market	
Energy purchasir	ng for SMEs
Overview of effic	ciency measures in building services
Energy-efficient air conditioning,	building services: heating, ventilation, cooling
Savings potentia	l for electricity
Calculation of pr	ofitability for energy-saving projects
Consulting and s	subsidy programs
User motivation	and internal communication
Introduction to $\epsilon$	energy management system according to ISO 50001
Energy audits	
Project work	

The course to become an European Energy Manager (EUREM) is also provided by WIFI. It consists of 6 modules:

MODULE 1	Energy management and climate protection, basics of energy technology, measurement, control and regulation technology, energy data management, operational energy flows, purchasing of different energy sources, economic efficiency calculation
MODULE 2	Energy law, subsidies, benchmarks, refrigeration, air conditioning and ventilation technology, solar cooling, building cooling, internal and external cooling loads, heat pump technology
MODULE 3	Heating technology, cogeneration, biomass, solar thermal, and contracting
MODULE 4	Energy-efficient production, process heat, and heat recovery, energy-efficient building technology, building physics, building energy performance certificate, heat demand calculation, passive building technologies, compressed air, energy-efficient drives, electrical equipment, and motors
MODULE 5	Green IT, process management, load management, process heat, heat recovery, setting up in-house energy management in accordance with ISO 50001, project management, distribution of responsibilities, awareness-raising, communication, and employee motivation, energy audit, written exam
MODULE 6	Presentation technique, moderated exchange of experiences, supervision of project work during qualification

The trained "European Energy Managers" gain the necessary tools to implement efficient energy management in their own companies and thus achieve cost savings. The achieved degree consists of a written examination and the presentation of the company-specific project work. After successful completion, the participant receives a certificate as "European Energy Manager". The course complies with the established criteria for energy auditors by the Federal Ministry of Sustainability and Tourism. Target groups for the course are plant managers, production managers, process engineers, operating technicians, energy officers, facility managers, and consultants<sup>15</sup>.

https://www.stmk.wifi.at/kurs/56178x-qualifizierung-zum-europaeischen-energie-manager-eurem

#### **ENERGY CONSULTING TRAINING - BASIC COURSE (A-COURSE)**

4.4.4

This course is provided by WIFI in cooperation with the Energy and Environment Agency of the Province of Lower Austria and DIE UMWELTBERATUNG.

It is the basic course of the energy consultant training and therefore teaches the basics and interrelationships in the areas of:



It is designed to enable the students to evaluate energy consumption in small-volume housing and in households, to recognize energy-saving potential, and to know at which level savings can be achieved. Knowledge of different specialist areas is combined and is thus a supplement for people who work in a specialist area (e.g. in the construction sector or with installation companies) and want to gain an overview, for example in order to be able to advise customers comprehensively or make decisions with more background knowledge. After positive completion of the energy consultant/inside training basic course (A-course), one has got the possibility of deepening the knowledge of energy literacy and, particularly concerning the consulting practice, in the energy consultant/inside continuation course (F-course).

The contents of the course concern the energy situation worldwide and in Austria, energy consumption in the household and self-assessment of energy consumption and CO2 emissions, the greenhouse effect, and climate change adaptation. One is also taught the basics of physics when it comes to energy, power, climate terms, the value of energy, exergy and anergy. Further points concerning buildings are:

Comfort
indoor climate
U-value calculation
energy demand of buildings
energy index
building and insulation materials
building physics
ecology
heating load calculation of a simple building
energy balance

energy certificate
energy saving by thermal improvement
water heating
efficiency of heating systems
boilers
combustion and condensing technology
heat distribution, heat control, and heat
delivery
distribution systems

The use of renewable energies such as biomass, photovoltaics, solar thermal and heat pumps is also taught within the course. For the household, the course contains information about electricity consumption in the household, lighting, household appliances, energy labels, user behavior and about the rebound effect. After completing the course, one knows about the overall evaluation of a single-family house, plus-energy buildings, self-sufficiency, and consulting exercises.

This far-reaching course is meant for employees of consulting centers, energy supply, and service companies, energy agencies, and employees in public services, e.g. municipalities. But it is not limited to employees in this field. It is also offered to professions such as chimney sweeps as well as students or otherwise simply interested private persons<sup>16</sup>.

<sup>16</sup> https://www.noe.wifi.at/kurs/32722x-ausbildung-energieberatung-grund-kurs-a-kurs?vanr=32722012&\_ga=2.90311442.968693733.1650526518-635005945.1650526518



#### SMARTER TOGETHER - ENERGY SAVING CAFÉ

4.4.5

The energy-saving café is a free-of-charge event in Vienna, Austria, where energy experts have a direct and informal exchange with local residents about energy-saving measures. The information is presented in an easy-to-understand and practical way. In this interactive workshop, the participants get an overview of the average energy consumption of a household and the different energy efficiency of buildings. The topics covered include heating systems, household appliances, lighting, and windows. Individual user behavior is also taken into account. Together, they work out how this can be optimized in order to reduce energy costs<sup>17</sup>.

17 https://www.umweltberatung.at/referenz-smarter-together

#### **BASIC COURSE FOR ENERGY CONSULTANTS**

The Energy Academy together with the energy-saving association and WIFI provides a basic course for energy consultants. This basic course offers basic knowledge in the areas of energy efficiency and renewable energy. It includes know-how on the topics of building physics, energy technology as well as economic aspects and subsidies. Participants get to know the handbook for energy consultants and practice on the basis of numerous case studies. The energy consultant training is aimed at people from

companies and institutions that deal with energy issues and are interested in energy efficiency and the use of renewable energy sources. The basic course offers an additional qualification and further training in the energy sector and corresponds to the Austria-wide energy consultant training. It is also a training recognized under the Federal Energy Efficiency Act.

The course consists of 52 training sessions and a final exam. The training sessions have the following content and structure:

	Building physics – structural engineering (Building materials, components, insulating material, U-value calculation, energy optimized planning)
TECHNICAL BASICS	Energy performance certificate, energy indicators
	Energy technology (Heat generation, distribution, delivery, Heating and control, water heating, renewable energy sources power saving, efficient lighting)
BASIC ENERGY KNOWLEDGE	Energy production and consumption, energy terms, subsidies, energy flows, energy system house
PRACTICE	Case studies, Introduction to the handbook for energy consultants, communication training

The course is divided into two theoretical blocks, basic technical and basic energy knowledge, and a third practical block. The target group of the course consists of planners, installers, master builders, property developers, architects, suppliers of building and heating technology, energy certificate issuers, energy consultants, energy auditors, and so on. To participate in the course, one has to pay 1008 Euro, where the seminar documents and the final examination are included<sup>18</sup>.

18

# Identifying gaps 4.5

The educational offers in the field of adult education concerning energy literacy in Austria have mostly similar structures. When it comes to the content of the training courses, most start out with an introduction to basic knowledge in physics or energy terms. Most offers, especially those by the WIFI institute, are trainings in the area of energy consulting, so one does not only get input in the theoretical part of energy management and energy literacy but also knowledge about consulting and the social aspect surrounding it. The courses are not necessarily directed at private households but rather at employees who want to gain additional knowledge for a better position in the job market, even though most of the courses provide some knowledge on energy management within a household. Therefore, in some courses, some basic knowledge is required. When private households or residents are the target group, the course material is offered in a more informal way, such as online learning material or even as a talk with experts in a café.

As written before, most people in Austria that partake in adult education have already experience in education and want to deepen it. Also, adult educational offers in Austria are accepted by people with higher economic backgrounds. Therefore, it comes as no surprise, that most educational offers are costly and require some sort of prior knowledge.

Here, the educational offers provided by EL-Practice can fill a gap and bring more equality and heterogeneity into the field of adult education. Since the learning materials and gamified e-learning platform can be used for free and online, there are fewer obstacles for people from lower income households. It fits well into the aim of the Initiative Erwachsenenbildung (Initiative for Adult Education) to enable adults living in Austria to acquire basic skills and educational qualifications free of charge in order to open up better access opportunities to the labor market. Since it is not planned for users to have any sort of prior knowledge about energy literacy, EL-Practice helps break the trend in Austria for mostly only already educated people to pursue adult education. The educational course "energie führerschein" does have a few similarities with the EL-practice's educational offers. With everyday topics like information about the electric bill, for example, the information provided by "energie führerschein" is relevant for the EL-Practice target group, being young adults. It is offered as a course but there is also the option of self-studying via learning materials that are provided online and an app. However, while one can obtain the educational material of the "energie führerschein" (energy license) for free, one has to pay as well to take the exam and obtain a certificate.

Also, most educational offers concerning energy literacy are either directed at young people of school-age to teach them the basics of energy literacy or directed at people who are already educated in the field and want further education. The target group of EL-Practice, namely young adults in their twenties and thirties, who are not necessarily educated in the energy field, are not sufficiently covered in the educational offers of adult education in Austria. For this target group, especially the offer of a gamified e-learning platform by EL-Practice can be important because most people in this target group might work and also have a young family at home. Since most courses and training options in Austria are in-person courses and also sometimes are related to work in a company, these might not come into question for EL-Practice's target group. Since most courses offered in Austria are targeted at certain professions, they might be daunting to people who want to become energy literate for their own household and day-to-day life. Therefore, a gamified e-learning platform, provided by EL-Practice, is well-suited to reach this group of people. Another advantage of the e-learning platform is that it can be reached from anywhere. Most courses regarding energy literacy take place in the bigger cities in Austria, like Vienna or Graz, which excludes young adults living in rural regions of Austria.



## CROATIA

#### Introduction

5.1

The education system in the Republic of Croatia consists of early and preschool education, primary education, secondary education, and higher education. Adult education is part of the unique education system of the Republic of Croatia and includes learning processes intended for better employability and personal development of the individual. It is focused on obtaining and developing critical competencies as part of lifelong learning and the acquisition of knowledge and skills needed to acquire sets of learning outcomes or qualifications. According to the Adult Education Act of the Republic of Croatia, adult education takes place as formal, non-formal, and informal learning and is based on the principles of lifelong learning, rights to education, free choice of type, and manner of education, and inclusiveness and accessibility<sup>1</sup>.

This report seeks to analyze and identify adult education related to energy literacy, renewable sources, and green transition in the Republic of Croatia. The analysis will present formal and informal educational options, seminars, workshops, and projects which are developed to gain knowledge and competencies in the field of energy. As part of formal education, studies related to energy are highly valued in Croatia, with programs such as Study of Energy Efficiency and Renewable Sources, and the most respected faculties being the Faculty of Electrical Engineering and Computing and the Faculty of Mechanical Engineering and Naval Architecture in the City of Zagreb.

However, when analyzing the non-formal learning options in the field of energy for young adults, options are still quite limited in Croatia. Most educational training is developed for professionals in the industry and focuses on one or two specific topics, while there is still a need for a broader, more in-depth energy literacy course for citizens, including young adults. With witnessing drastic changes in energy prices, it is more necessary than ever to work on adult education in the field of energy literacy which will help individuals and communities to make informed energy decisions every day.

# Legal Framework 5.2

In the following section, the strategic plans and documents which emphasize the need for education of adults and citizens, both on the European and Croatian level, in the sector of energy and sustainability, will be presented and analyzed.

On the European level, ambitions set by the European Green Deal were addressed in the GreenComp, a reference tool that can serve a wide range of purposes – as a curricula review, design of education programs, assessment/reflection, policy development, and other. Furthermore, the European Commission has published policy papers entitled European Skills Agenda for Sustainable Competitiveness, Social Fairness and Resilience (2020) and the European Education Area by 2025 (2020) as well as a biodiversity strategy for 2030: 'Bringing Nature Back into our Lives' (2020). All these policy papers and strategies recommend activating education and training by developing skills and investing in learning for environmental sustainability and to move Europe towards becoming a climate-neutral continent by 2050<sup>2</sup>.

In terms of energy literacy, the Croatian legal framework does not focus specifically on emphasizing its importance. There is an Energy Efficiency law, but the education of adults is not emphasized by that law. However, the Law on Renewable Energy Sources and High-Efficiency Cogeneration mentions the importance of new educational and retraining programs for professional staff<sup>3</sup>. But this is mainly concerning working professionals already in the industry that need additional education or retraining. This law also indicates that the Ministry, with the participation of local and regional self-government bodies, can develop an appropriate program of information, to inform the citizens on how to exercise their rights as active users and on the benefits of energy from renewable sources<sup>4</sup>. However, this law does not imply how this should be done and does not oblige ministries to implement such activities.

The importance of the education of adults in terms of energy has been highlighted in other strategic documents of the Republic of Croatia. One of them is the Energy Development Strategy of the Republic of Croatia until 2030 with a view to 2050, in which education and communication with the public are mentioned through measures resulting from the process of strategic environmental impact assessment<sup>5</sup>. Another strategic document that highlights the importance of education related to energy is the Integrated National Energy and Climate Plan for the Republic of Croatia for the period from 2021 to 2030. In this strategic document,

<sup>2</sup> GreenComp, The European sustainability competence framework: jrc128040\_greencomp\_f2.pdf (green-comp.eu)

Zakon o energetskoj učinkovitosti - Zakon.hr

Zakon o obnovljivim izvorima energije i visokoučinkovitoj kogeneraciji - Zakon.hr

<sup>5</sup> Strategija energetskog razvoja Republike Hrvatske do 2030. s pogledóm na 2050. godinu (nn.hr)

education is mentioned as an important measure toward green transition, emphasizing the importance of attracting the young people into construction and technical occupations, whose knowledge in the long term is the basis for achieving energy and climate goals. Also, the strategic document Energy Poverty Reduction Program has outlined an overview of educational and awareness-raising activities for citizens with lower levels of education and those unemployed.

# Main goals & methodology

5.3

While the discussion on energy literacy in the literature started mainly by focusing on the aspect of knowledge, the research soon shifted and started to understand it as a more comprehensive concept. This is because only knowledge does not determine, by itself, an effective behavioral change. Taking into consideration that the term energy literacy is defined as an understanding of the nature and role of energy in the world and daily lives, accompanied by the ability to apply this understanding to answer questions and solve problems<sup>8</sup>, it is visible that approaching energy literacy only through the aspect of knowledge is not complete. Therefore, energy literacy emerges, in more recent literature, as a broad concept encompassing three dimensions: knowledge, attitude, and behavior<sup>9</sup>. These three dimensions of energy literacy will be covered and applied during the EL-Practice project, which aims to identify the knowledge gaps and develop innovative ways of micro training for young adults, resulting in a more knowledge-based behavior, accompanied by a positive shift when making decisions.

The goal of this report is to present and describe available energy literacy education and identify gaps between the available projects, seminars, and others in the field of energy in the Republic of Croatia. First, a literature review was conducted to understand the legal framework for the discussion of energy literacy on the European level and in the Republic of Croatia. Next, via a search engine, available online content related to keywords "energy literacy", "energy literacy in Croatia", "energy education in Croatia", and "energy courses in Croatia" were reviewed and identified. Then, in more in-depth research, we focused on available materials and specializations that are offered and are still relevant to young adults. This way, we focused our research on the most reliable data that is still relevant today.

<sup>6</sup> Integrirani nacionalni energetski i klimatski plan Republike Hrvatske \_final.pdf (gov.hr)

Program suzbijanja energetskog siromaštva koji uključuje korištenje obnovljivih izvora energije u stambenim zgradama na potpomognutim područjima i područjima posebne državne skrbi za razdoblje 2019. – 2021. godine (gov.hr)

<sup>8</sup> Energy Literacy: Essential Principles for Energy Education | Department of Energy

<sup>9</sup> Energy literacy: What is out there to know? - ScienceDirect

# Educational offers 5.4

For this report, we have analyzed current educational offers in the Republic of Croatia regarding energy literacy. When it comes to formal education, several faculties offer education in the field of energetics, in different Universities across Croatia. However, when it comes to the non-formal and informal education, it can be noticed that the options are still quite limited for young adults. For now, they can acquire information from the regional energy agencies, the specific educational materials available online, seminars, and projects - all mainly funded by the European Union. Therefore, there is an identified need for a more general, in-depth energy literacy course for young adults. In the following section, we will present current available educational platforms, materials, and projects in the segment of energetics, sustainable development, specializations for energy professionals, and green occupations, which will allow identify the gaps in the educational offers contributing to energy literacy.

#### **REGIONAL ENERGY AGENCIES**

5.4.1

There are five (5) Regional energy agencies in Croatia. Their role is to promote and encourage regional sustainable development in the field of energy and environmental protection using renewable energy sources and the introduction of energy efficiency measures, introduction of good energy management practices, promote sustainable development, provide information and advice, and other services based on specific local needs for energy. One of the most important activities of regional agencies is the development of local energy efficiency programs and action plans according to the National Energy Efficiency Action Plan.

Regional energy agencies are deployed throughout Croatia and contribute also to public advisory service in the form of information, awareness-raising, training, and similar, to local energy and private sector decision-makers, households, and citizens. Energy agencies in Croatia are as follows: IRENA - Istrian Regional Energy Agency d.o.o., Regional Energy Agency North, Regional Energy Agency Kvarner, REGEA - Regional Energy Agency of Northwest Croatia, and MENEA - Međimurje Energy Agency d.o.o.<sup>10</sup>



#### THE FACULTY OF MECHANICAL ENGINEERING AND NAVAL ARCHITECTURE (FAMENA)

5.4.2

An example from the formal education segment, the Department of Power Plants and Energy at the Faculty of Mechanical Engineering and Naval Architecture in Zagreb, offers education, research, and development in the field of energy engineering and energy management, which includes: power plants, regulation, and system dynamics, modern numerical methods to simulate combustion and pollutant formation (computer fluid dynamics - CFD), energy economics, planning of power plants and systems, as well as their integration with other systems (energy-waste-transport), energy management, energy efficiency, conventional and renewable energy sources (including energy from waste), hydrogen technology and economics, change climate and energy policy, and energy storage. The department is involved in various national and international EU projects (HRZZ, LIFE, FP6, IEE, FP7, Horizon2020) and a wide range of cooperation with industry, electricity, small and medium enterprises, and government institutions<sup>11</sup>. Through all these activities, FAMENA creates future energy-educated professionals.

#### THE SOCIETY FOR THE DESIGN OF SUSTAINABLE DEVELOPMENT (DOOR)

5.4.3

DOOR is an association of experts dealing with sustainable development, primarily in the field of energy. DOOR is working in two strategic directions - the transition to a low-carbon society and the alleviation of energy poverty, with energy efficiency being the key measure in both areas. Therefore, DOOR raises the level of awareness of Croatian citizens about energy efficiency, conducts educational activities in this field, participates in the development of action and annual energy efficiency plans and other public policies relevant to energy efficiency<sup>12</sup>.

DOOR has several educational materials available online, such as:

Educational program - Technical training for energy consultants

Climate Hero - Small actions for big impact

Renewable energy sources - a picture book for learning and entertainment

<sup>11</sup> https://www.enu.hr/ee-u-hrvatskoj/tko-je-tko-ee-rh/institucije-podrucja-ee/

<sup>12</sup> https://www.enu.hr/ee-u-hrvatskoj/tko-je-tko-ee-rh/institucije-podrucja-ee/

Renewable energy sources- picture book

Educational kit for the use of solar energy, 2006, project "Sun in Istria"

An educational kit for the use of solar energy

Renewable energy sources - worksheets, project "Small school of clean energy"

Small steps to big changes: Teachers and students together for a greener future!

Handbook on the introduction of courses on socially useful learning within the project FER solutions for a better community

Handbook: Knowledge for sustainable action - from theory to practice

Methodological guide for the implementation of an interdisciplinary course for sustainable conversion and renewal of urban spaces

The interdisciplinary curriculum of the course for conversion and renewal of urbar spaces<sup>13</sup>

### **REGIONAL ENERGY AGENCIES**

5.4.4

HSZG was established in 2009 with the key goal to lead the transformation of the Croatian construction and real estate market towards sustainability, promoting green building programs and technologies, as well as integrating available and acquired knowledge, and experience about green building in the design and construction of buildings in Croatia<sup>14</sup>.

HSZG offers also multiple webinars and education on its website, such as:

KI webinar	Green sustainable solutions for roofs, walls, and other surfaces	
Webinar	Sustainable solutions in construction	
Educational program		
Online training	How to design according to nZEB (building with almost zero energy consumption)? (https://gbccroatia.org/dogadanja-i-edukacije)	

<sup>13</sup> https://door.hr/knjiznica-2/obrazovni\_materijali/

<sup>14</sup> https://www.enu.hr/ee-u-hrvatskoj/tko-je-tko-ee-rh/institucije-podrucja-ee/

### **HEP ESCO**

5.4.5

HEP ESCO is a company within the HEP Group that develops, implements, and finances energy efficiency and renewable energy projects. In addition to this core business, HEP ESCO also offers several other energy services in the field of energy management. Services include energy audits of buildings, facility certification, energy analysis, determination of energy base and consumption indicators, end-user education services at all levels, and others. Regarding the education services, HEP ESCO has an online Training Centre for professionals in the industry as well as for the citizens<sup>15</sup>.

HEP ESCO offers three educational modules on their website 16:

GREEN
BUSINESS
<b>WORKSHOP</b>

Motivational workshop that raises the awareness of employees about the importance of rational energy use in regular activities. The goal of educational activities is to raise awareness of how small changes in behavior, at the individual level, can make big changes at the organizational level.

## COURSE FOR ENERGY MANAGERS

A two-day course, intended for those responsible for energy as well as those responsible for managing facilities in the private and public sectors. The course aims to raise the standards in this area.

## E-COURSE "GREEN OFFICE"

The online free training "Green Office" is intended for employees who work in offices and aims to make employees aware of how small changes in behavior at the individual level can contribute to reducing energy consumption and sustainable business operations of the organization

However, when it comes to the citizens' education, the offer of educational materials on the HEP ESCO website is limited. There is available some basic information, for example, a section dedicated to Energy advice of the month and short information on energy efficiency tips for citizens, but there is a need for more general and targeted energy efficiency modules for citizens including young adults.

### **ENERGY COOPERATIVES**

5.4.6

Energy cooperatives are associations of individuals, companies, public institutions, and local governments, connected according to the key location, which together develops renewable energy projects. This way, they reduce investment risk and share project profits. Energy cooperatives are organized democratically when deciding on all issues of cooperative management.

<sup>15</sup> https://www.enu.hr/ee-u-hrvatskoj/tko-je-tko-ee-rh/institucije-podrucja-ee/

<sup>16</sup> https://www.hep.hr/esco/energetske-usluge-1831/trening-centar-1532/tecajevi/2989



The goal of such cooperatives is to promote renewable energy sources owned by local communities. This enables easier implementation of energy efficiency measures aimed at the local community because cooperatives can achieve greater bargaining power, and greater trust in the knowledge and operate at a higher level than the individual. There are currently 8 energy cooperatives in Croatia: BAN-UNION, Green Energy Cooperative (ZEZ), Mission of the Energy Cooperative Island of Krk, Energy Cooperative Kaštela, Energy Cooperative Lug, Energy Cooperative Sunčani Hvar, Veterans Cooperative Ka-Solar, and Energy Cooperative SPES.

Perhaps the greatest recognition among those listed has the Green Energy Cooperative (ZEZ), a cooperative that deals with planning and managing projects for the application of renewable energy sources and energy efficiency. ZEZ cooperative was established to operate in the local community with special emphasis on the sustainable development of tourism, agriculture, and commercial and public institutions. ZEZ especially nurtures the principle of cooperation with individuals, companies, institutions, and all other stakeholders whose primary interest is a socially responsible business and sustainable development of local communities. Recognizable educational offers by the ZEZ cooperative are the Good Energy Festival, an annual event of the Green Energy Cooperative dedicated to civic energy, and the publication *Civic Energy - A Guide to the Establishment of Energy Communities*<sup>17</sup>.

The vision of the Island Movement is a connected, self-sufficient island community with

<sup>17</sup> https://www.zez.coop/

### **ISLAND MOVEMENT (POKRET OTOKA)**

5.4.7

continuous active contribution to energy independence, diversification of the economy and agriculture, and general strengthening of the resilience of Croatian islands to environmental and economic challenges. The Island Movement aims to create a self-sufficient island community that understands and articulates its needs, is informed about opportunities and possibilities, and actively participates in decision-making processes.

Examples of educational activities developed by the Island Movement include among others<sup>18</sup>:

SILBA & IŽ - Education "Solar power plants on the roofs of houses - how, why, and how much it pays off?

Program "Humanity at the Crossroads: Croatian Islands on the Road to Green Transition"

Seminar "Funding sources for renewable energy projects on islands"



### **BIMZED PROJECT**

5.4.8

The BIMzeED project, co-founded by the Erasmus+ Programme of the European Union, aims to define the training that the construction industry currently needs, as well as what will be needed in the future to encourage: better employment opportunities, low-carbon development, green skills, and skills to build near-zero energy buildings (nZEB) and to increase youth employment. The challenge of the BIMzeED project is to overcome skills mismatches and improve employment opportunities in the current European construction market by improving the existing skills of coaches, SMEs, construction site managers, craftsmen, and other construction workers. BIMzeED plans to educate 400-500 students, construction site managers, craftsmen, and other participants in the construction project, to improve their employment opportunities. The BIMzeED project is harmonized with the strategic EU document "Education and Training Strategy 2020 - ET2020" - development of EU programs in higher education and thus ensures small and medium enterprises keep pace with the accelerated development of technology in the nZEB and BIM industry<sup>19</sup>. In Croatia, training materials developed within this project, have become part of teaching materials at colleges.

# Identifying gaps 5.5

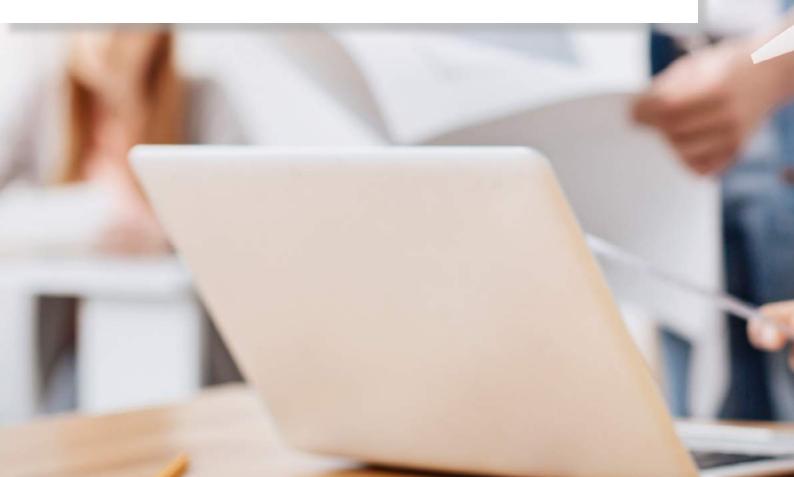
Following the analysis of the available educational offers related to energy literacy in the Republic of Croatia, it was found that the importance of energy literacy is still not acknowledged enough among institutions, educational centers, and citizens. During the analysis and search engine research, it was found that the terminology related to literacy is mostly related to financial literacy, rather than to energy literacy. Also, many more strategically developed documents and education offers are focused on financial rather than energy literacy. However, energy literacy directly affects the financial actions, decision-making, and purchasing power of individuals. Thus, a much greater focus and attention should be placed on providing adequate energy literacy education. This is especially important now, at a time of unpredictable growth in energy prices.

Secondly, in the segment of formal university education, programs related to energy and renewable energy sources are highly recognized and have a well-adapted, rounded education curriculum. However, in the segment of non-formal and informal education, the situation is different. There is a visible lack of strategic documents at the government level that could shed light on the importance of energy literacy, as well as the offer of additional

education and training. Given that economically, supply is defined by demand, we can assume that Croatian citizens are still not sufficiently energy literate to be able to identify the benefits of additional education in this area. It is for this reason that it is necessary to first raise awareness and encourage dialogue on the importance of additional education for young adults in the segment of energy efficiency.

Thirdly, this analysis highlighted the fact that currently available energy-related educational materials, pieces of training, seminars, webinars, and workshops are highly dispersed and fragmented on the market. Several stakeholders are offering educational materials, but most of them are specialized and have been developed for existing professionals in the energy sector. Also, educational materials that are prepared for the citizens, are a bit outdated and not adequately communicated or promoted. In general, although there is a certain body of available materials, which certainly have their educational value, there is a lack of promotional activities around them for the public to recognize their value. However, there is also the National Energy Efficiency Portal, which was not included in the analysis of this report but offers a range of general information for citizens, the public, and the commercial sector. But similar gaps have been identified regarding the National Energy Efficiency Portal - too much general information, outdated publications, and a lack of a comprehensive, structured, and relevant energy literacy course for citizens.

In conclusion, this analysis identified key gaps in educational offers on energy literacy in the Republic of Croatia. It is these gaps that will help while building the EL-Practice project, through development of interesting, dynamic micro-trainings on the platform. The project will also educate staff and a group of young adults, who will help further disseminate the platform. The innovative aspect of developing those micro pieces of training will be of most importance, as young adults want their education to feel relevant to them. Education today, needs to be shifted in curriculums to be more meaningful with real examples and case studies of relevance.







# 

## Introduction

6.1

Greece is a country located in Southern Europe possessing an archipelago of about 2,000 islands. The land borders of Greece are Albania, Macedonia, Bulgaria, Turkey, the Aegean Sea, the Ionia Sea, and the Mediterranean Sea. Athens is the nation's capital and largest city, followed by Thessaloniki. The country consists of nine traditional geographic regions, and has a population of approximately 10.7 million. Attiki, the area around the capital, is now home to about one-third of the country's entire population. The 99% of the population in Greece speak the Greek language but there are a number of non-official languages which are the minority. In addition, there are some Greek dialects that are spoken. For example, Cretan Greek which is spoken in the island of Crete, Maniot Greek dialect which is spoken in the local area of Mani, Pontic Greek dialect is originally spoken in Pontus, Thracian Greek is spoken mainly in Western Thrace and by the Greek minority in other areas of Thrace outside the Greek borders, Sarakatsani an archaic dialect of Greek spoken by the Sarakatsani of Greek Macedonia and Tsakonian Greek which is used by some in the Tsakonia region of Peloponnese. The most common foreign languages learned by Greeks are English, German, French and Italian.

The Greek educational system is mainly divided into three levels. Primary, secondary and tertiary, with an additional post-secondary level providing vocational training. Higher Education constitutes the last level of the education system and comprises the University and Technological sectors. The University sector includes Universities, Technical Universities, and the School of Fine Arts. The Technological sector included the Technological Education Institutions (TEIs) which were merged in 2019 into the Universities, and the School of Pedagogical and Technological Education (ASPETE). Higher education institutions are fully self-administered legal entities of public law.

The main administrative body for the education system in Greece is the Ministry of Education and Religious Affairs which takes the key decisions for the long-term objectives and regulates the staff recruitment, the curricula content and the control of the funding. The holistic concept of general adult education includes all organized learning activities (formal and non-formal) aimed at adults and seeking to enrich their knowledge, develop their abilities and skills, develop their personality and become active citizens.

General adult education has been adopted by a large number of educational institutions that are fully or partially subsidized by the state. Adult education and lifelong learning, in Greece, over the last decade, is coordinated with the vocational training policies developed in the EU (EU 1995, learning society - White Paper -, 1997, Europe of knowledge, 2001, Critical Science and Education, 2006, European Area of Lifelong Learning) and utilizes funding for European programs.

The responsibility for the implementation of the actions as well as their scientific support programs related to lifelong learning are part of the Lifelong Institute Education and Training (IDEKE) which manages the following programs:

The Adult Education Centers.

- Second Chance Schools.
- Parental Counseling.
- Volunteering.
- Education and Culture.
- The Education of Adult Immigrants in the Greek Language

The Ministry of education is organizing a various number of initiatives in schools, which are related to environmental actions and the aim is to introduce the concept of Sustainable development. For the students, in order to better understand the concept, it is important the development of the knowledge, values, attitudes and behavior that lead to positive actions for achieving the transition to "zero waste" that is a major goal.

# Legal Framework 6.2

Greece plays a pivotal role in charting the energy map of Europe addressing the diverse and challenging questions of the world related to energy production and supply and emerging as a strategic energy hub. As is located to the Europe's southeast part is the gateway to the East and West. Greece has made significant efforts to advance energy sector reforms in a challenging environment of declining consumption and constrained finances. The Greek government is trying through programs and actions to create a more energy efficient society focusing on renewable energy sources as much as possible. In addition, through educational programs, it tries to cultivate in young adults the mentality of prudent energy consumption.

Greek Higher Education Institutions through the program "Network of Greek Universities for Sustainability" and "Energy Upgrading of Public Buildings in Universities, Dormitories, and facilities of Technological Institutions"<sup>1</sup> can turn for research and implementation of relevant actions such as energy upgrade to electromechanical equipment and passive components of buildings to reduce energy consumption, development of "smart" applications for monitoring and control of energy consumption, utilization of RES electricity generation applications, either from mature technologies, such as photovoltaic, or from innovative applications, such as hybrid systems, creation of hybrid energy storage systems that can deliver energy to the system on demand, promoting electric mobility from charging infrastructure to innovative conversions and other innovative systems and the development of new innovative products, services and applications that promote sustainable development.

The "Save" Program is part of the flagship projects carried out by the Recovery and Sustainability Fund, improving the energy class of households, by at least 3 energy categories (over 30% Primary Energy Saving). The investment of the project will contribute to the energy savings of at least 213 ktoe and to the energy renovation of at least 105,000 inhabitants by 2025.

- 1 https://studyingreece.edu.gr/greek-higher-education-institutions-as-energy-transition-catalysts/
- 2 https://exoikonomo2021.gov.gr/

As far as the education and energy literacy of adults is concerned, it is approached by the Greek state mainly through universities, either through undergraduate or postgraduate studies. Recent years and after the new conditions that Covid-19 has brought to education, online seminars have been established which after their completion provide a certificate of attendance.

An important part of adult education in Greece is also occupied by lifelong learning centers which provide state-certified and recognized education on energy management issues. Non-formal education actions and in particular general adult education actions will be implemented in lifelong learning centers. Lifelong learning centers are aimed at adult workers and employees, shaped by gender, ear level, country of origin, religion, place of residence, young people, students, etc., with the sole condition that they are interested in knowledge and active participation. For example, the program "Renewable energy sources" provided by the Center for Lifelong Learning of the Kapodistrian University of Athens is a two-year training with minimal costs. The purpose of this Training Program is to educate those interested in green economy and renewable energy sources.

Recognized adult education in Greece on issues related to energy consumption and production is also provided by secondary schools. A Second Chance School constitutes an innovative public adult education school of two academic years' duration. A certificate equivalent to secondary school diploma is provided after successful attendance. The school's curriculum differs from that of the normal education, it is more flexible and it follows an adapted teaching methodology and assessment of the trainees.

The Second Chance Schools were established in Greece by the Law 2525/97, in the context specified by the declared principles of the European Union. The program forms part of the Operational Programme "Education and Lifelong Learning" of the Ministry of Education, Research and Religious Affairs and it is co-funded by the European Union (European Social Fund) and national funding. An example is the 3rd secondary school of Sofades which provides an educational program on "The use of Renewable energy sources". Additionally, the Second Chance School of Karditsa on March 2022 held an event on renewable energy sources".

Other public bodies involved in adult education through programs related to the environment, sustainability or renewable energy sources are the "Sustainability and Environment Training Centers" as well as the "National Agency for the Certification of Qualifications and Vocational Guidance".

<sup>3</sup> https://www.epimorfosiekpa.gr/index.php/ekpaideftika-programmata/thematiko-pedio-2-perival-lon-klimatiki-allagi-diaxeirisi-katastrofon-kai-kriseon-geoepistimes/ananeosimes-piges-energeias

<sup>4</sup> http://sde-kardits.kar.sch.gr/wp-content/uploads/2013/07/%CE%91%CE%9D%CE%9D%CE%9D%CE%95%CE%A3%CE%99%CE%95%CE%A3%CE%95%CE%A3%CE%95%CE%A3%CE%95%CE%A3-%CE%A0%CE%95%CE%95%CE%A3-%CE%95%CE%9D%CE%95%CE%A1%CE%93%CE%95%CE%99%CE%91%CE%A3-%CE%92-%CE%A4%CE%91%CE%9E%CE%97.pdf

 $<sup>\</sup>label{lem:com_content_view} 5 \qquad \text{https://www.epikairotita.info/index.php?option=com_content\&view=article\&id=23211:sde&catid=17:2010-09-21-08-18-25&ltemid=25 \\$ 

# Main goals & methodology

6.3

Overpopulation. Population movements for various reasons. Lack of food and water due to desertification of areas. Lack of energy due to increased demand and controlled resources. Adding to the extreme weather, the situation becomes quite complicated. Ultimately, it seems that we are to blame for global warming. Perhaps at the individual level, we are fully responsible for climate change.

For this reason, energy literacy is a key prerequisite for starting action. An energy literate person means that is aware of the consequences of his/her actions in terms of energy consumption and production. Greece is favored by sunshine, wind and geothermal, beyond any mineral wealth, and it would be useful to make the most of the use of devices that will allow the exploitation of these resources.

The purpose of this national report is the analysis of the offered education for adults on energy topics in order to be developed educational material to strengthen the energy literacy. Data collected after desk research from various websites.

The official website of the state was the main page regarding the legal framework for the adult's education in general as well as for the education of energy literacy, sustainability and environment issues. Then we expanded to search for programs run by other public bodies. In Greece, apart from the Universities which are the main body of adult education, the Lifelong Learning Centers, the second chance schools, the seminars recognized by EOPPEP, the Open University as well as KEKs provide many programs on various topics including topics of sustainability and energy sources.

# Educational offers 6.4

As mentioned above, there are several agencies for adult education in Greece. Most important of all, are the Universities which have numerous curricula on energy but in addition there are endless opportunities from other public bodies such as lifelong learning centers, second chance schools, the Open University, KEK as well as seminars or certifications from other public bodies.

Below are described educational programs on the topic of Energy consumption, on Renewable

sources of Energy or energy management. Also are described the educational materials and training curricula of some Masters of science on sustainable development, green energy or renewable energy sources.



## MASTER OF SCIENCE 'ENERGY PRODUCTION AND MANAGEMENT'

6.4.1

The University of Electrical and Computer Engineering in collaboration with the Schools of Mechanical Engineering, Chemical Engineering, Civil Engineering and Shipbuilding Mechanical Engineering of the NTUA organizes the Interdepartmental Postgraduate Program (MPPS) "Energy Production and Management Operated by 1998" to engineers and other positive scientists.

The Program offers comprehensive postgraduate education in the following topics:

Energy markets

Production of energy from conventional and renewable sources

Energy storage and H2 technologies

Energy markets

Transmission and distribution of electricity

Intelligent network technologies

Scattered energy resources

Electrification of energy uses and energy savings and efficiency

Environmental issues

Investment evaluation and energy project management

The aim of the Program is to deepen the interdisciplinary methods of approaching and dealing with modern energy issues in order to form executives with horizontal training and specialized knowledge.

### **MASTER OF SCIENCE 'RENEWABLE ENERGY SOURCES'**

6.4.2

The University of Patras runs the postgraduate program on 'Renewable Energy Sources'. The postgraduate curriculum deals with:

"Building the Future" aims to promote energy efficiency measures, which are provided for in European and National Legislation.

### Specifically:

- is a hub for informing citizens about energy savings and methods to improve energy efficiency, providing information not only on available energy saving technologies and systems, but also on the potential for utilizing financing mechanisms and other national programs.
- is a key tool for the consumer, as it includes simple user-friendly online applications to reduce his energy costs in his home, but also to seek certified products and market suppliers, who participate in the Program through the process of "voluntary agreement"
- gives useful information to the supplier and craftsman of energy products, which concern both the methodology of product certification, as well as the methods of their placement in buildings.

The Program aims to raise public awareness of energy saving issues and the benefits of improving the energy efficiency of buildings. The promotion of energy upgrade measures in buildings focuses on actions for:

- the citizen and the consumer,
- the supplier and technician of energy products,
- the industrial sector,
- sectoral bodies and associations related to buildings, etc,

through targeted information, dissemination and information actions in conjunction with the conclusion of voluntary agreements that multiply the reduction of greenhouse gas emissions and contribute to the implementation of existing legislation and the achievement of national targets for energy savings by 20% by 2020.

### **'SAVE' PROJECT (ESPA)**

### 6.4.4

The object of the Program is the implementation of actions and proven good practices for the reduction of energy consumption in the urban environment, with emphasis mainly on the building sector (municipal buildings), as well as the upgrading of public spaces and secondarily in the field of municipal and private transport and energy-intensive municipal facilities, through the implementation of technical interventions and actions to raise awareness and mobilize citizens, local government, companies and agencies.

The implementation of the "SAVE" Program begins in 2009 and is a key part of the national energy strategy, in the context of planning and promoting energy efficiency actions.

The thematic Axes of the Program, in which appropriate energy interventions will be made are:

- Municipal Buildings
- Public spaces
- Transportation
- Technical Infrastructure
- Networking, Awareness, Technical Support

#### The Objectives of the Program are:

- Reducing energy consumption and peak load
- Reducing carbon dioxide emissions and reducing climate change
- The creation of a favorable urban environment and the reduction of the phenomenon of the urban thermal island
- Upgrading living conditions in buildings and cities
- The support of the local self-government and the citizens for the implementation of energy saving measures
- Raising public awareness on environmental management issues and changing daily behavior
- The mobilization of market forces and the promotion of investments in the direction of sustainable development.

### TRAINING IN THERMAL SOLAR SYSTEMS

645

The Act "Training and certification of knowledge and skills of employees in the field of solar thermal systems (THS) on the installation, regulation, monitoring and maintenance of THS" aims to provide targeted technical vocational training to 400 employees in private sector companies that are interested in the subject of maintenance, regulation, monitoring and maintenance of THS.

The training, which will be accompanied by the certification of the knowledge and the acquired qualifications / skills of the beneficiaries, concerns the special issues of installation, regulation, monitoring and maintenance of the Thermal Solar Systems (THS), a technology of exploitation of solar energy (ie. Renewable Energy Source - RES) with many prospects in Greece.

The following approach consists of the following distinct steps:

Provision of training (on a nationwide scale, ie in all 13 Regions of the country) to the beneficiaries based on a properly designed technical vocational training program,

Certification of the acquired knowledge / qualifications / skills of the beneficiaries of the above training programs, through the evaluation of their knowledge and ability by accredited certification bodies of qualifications / persons.

A series of actions are also foreseen for the widest possible information of the stakeholders and the competent national bodies, as well as the promotion / publicity of the project and the dissemination of its results.

### **MOVE ELECTRICALLY**

646

The purpose of this action is to define the terms, conditions and procedure for strengthening the market for purely electric or hybrid electric vehicles with external charging (with a limit CO2 emissions (50g / km), including bicycles, tricycles and bicycles, as defined in Article 7 hereof, with the possibility of withdrawing (or replacing) an old vehicle, as well as and the purchase and installation of "smart" home PC recharging point.

## MSC ENVIRONMENTAL CATALYSIS FOR POLLUTION AND CLEAN ENERGY PRODUCTION (HELLENIC OPEN UNIVERSITY)

6.4.7

More specifically, the program seeks to familiarize the graduate student with advanced adsorption, catalytic and photocatalytic anti-pollution processes, ie with processes of destruction or capture of substances released from static sources (eg urban and industrial sources) and mobile sources. x. vehicles) and pollute the atmosphere, as well as pollutant control processes found in various types of waste.

In particular, both in the context of the teaching of a unit, but also through special categories of anti-pollution processes covered by the dissertation (Seizure of pollutants from the aquatic environment by adsorption on the surface of solid adsorbents, gas pollution) the postgraduate student deals with very interesting issues related to environmental protection (anti-pollution).

The program also seeks to familiarize the graduate student with advanced processes related to the production of clean energy. In this context, the student is acquainted with the basic functions of refineries and mainly with those aimed at the production of environmentally friendly petroleum fuels (desulfurization), the production of biofuels (bioethanol, biodiesel, green diesel, biogas) and , storage and use of hydrogen (via fuel cells) for electricity generation.

## MSC ENVIRONMENTAL PLANNING (HELLENIC OPEN UNIVERSITY)

6.4.8

The purpose of MSc is the development of critical thinking, the acquisition of knowledge and the development of skills related to the sustainable management and protection of the environment by the scientists involved in the design, control and management of technical infrastructure projects, buildings, urban public space, landscape, cities, productive activities and the control of or adaptation to climate change.

The Postgraduate Program awards a Postgraduate Specialization Diploma in "Environmental Design" in the following Directions:

- Environmental Infrastructure Design
- Environmental Design of Cities and Buildings
- Environmental Planning for Tackling Climate Change

### **MSC ENERGY SYSTEMS**

6.4.9

The "MSc in Energy Systems" Postgraduate Program aims to:

- to provide high quality theoretical and applied knowledge on technology, applications, research and development in contemporary energy issues,
- in the professional perspective and development of its graduates in the dynamic fields of Energy.

Energy is a strategic development sector with a particularly large scientific-technological and research interest, while attracting significant investment interest and creating particularly remarkable employment prospects in both the Greek and the international / European market.

The MSc focuses its attention, among others, on issues such as: Renewable Energy Sources, Wind Photovoltaic Installations, Clean Electricity, Energy Management of Buildings, Hybrid Energy Systems, Energy Storage, Energy Saving Networks, Networks and Perspectives Impact, Optimization of Energy Solutions, Climate Change.

# Identifying gaps 5

According to the above data, some educational programs on energy and general environmental issues are provided by the formal education but also by other state bodies. Despite the opportunities that the Greek state and the legal Framework offer for educating the citizens on energy issues, the gaps are still many. This is initially visible from the percentage of public awareness on energy and environmental issues in general. More specifically, young adults who are also the action group in a society seem to have a lack of education in environmental issues. is also evident from the selection of young people in undergraduate and postgraduate studies related to energy. Many of the vacancies remain vacant as young adults are not even aware of the jobs that can be offered to them by these studies.

In particular, there are few programs that specifically target young adults. Usually, some existing knowledge is required from undergraduate studies which give the opportunity for continuation in the postgraduate studies. as far as university programs are concerned it is not possible for everyone to attend them if the subject of their undergraduate studies is not related.

Programs provided by other institutions such as lifelong learning centers or secondary schools are provided to individuals who meet specific social and often economic criteria. In addition, some of the graduate programs such as the Hellenic Open University have very high tuition fees so that it is not possible for everyone to attend them.

The energy literacy project was created specifically targeting young adults and provides a comprehensive training program ready to help Greece solve the problem of lack of education on energy issues.





## Introduction

7.1

Poland is a country located in Central Europe. It has population of over 38 million, including 15,26% young adults (2022, GUS). Education is compulsory till 18 years old. The primary responsibility for education lies with the Ministry of National Education. It consists: kindergarten (pre-school) education; primary school which lasts 8 years (grades 1-8); secondary school, which lasts 4 or 5 years depending on chosen learning path (high schools or technical school). The access to upper education on public universities is free. They offer first- and second-cycle programmes as well as long-cycle Master's degree programmes while only university-type HEIs can offer third-cycle programmes (doctoral studies) and are authorized to award doctoral degrees. Studies are organized in the form of full-time (studia stacjonarne) or part-time (studia niestacjonarne) programmes. The system of education in Poland allows for 22 years of continuous, uninterrupted schooling.

The Minister of National Education is also responsible for co-ordinating adult education, through the activities of the Department of Vocational and Continuing Education. It is responsible for many of the aspects of adult education. Activities which fall into this remit include the establishment and running of public continuing education centres, public practical training centres and in-service training centres, as well as for the definition of principles underlying the acquisition, complementing and improvement of vocational qualifications.

The Ministry of Labour and Social Policy is responsible for the courses for unemployed. Since 2005, it has been disposing of a database called the Register of Training Institutions (RIS), a compulsory register for all institutions interested in obtaining contracts for courses for the unemployed and searching for jobs.

Relating to adult education and training in Poland, following terms are used:

- 1. Continuing education (CE) is understood as education/training in schools for adults, stage II sectoral vocational schools and postsecondary schools, and as acquisition of new and supplementary knowledge, skills and vocational / professional qualifications in non-school settings by individuals who have completed full-time compulsory education. Education and training in Poland are potentially aimed at the adult population (over the age of 18) of 38.41 million, with the working age population (aged 25 to 64 years) representing 60% (2019).
- **2. Adult education** (AE) is used as an equivalent for adult education and training (AET). The scope of AET extends far beyond the fields of school education and higher education and traditional training courses leading to qualifications. AET is also provided as on-the-job practical training or as organised activities of citizens' groups or communities. There is no comprehensive definition of AET in Poland.

- This may result, on the one hand, from a vast area it covers, and on the other hand, from difficulties in assigning the responsibility for this type of education and training provision to a single administrative structure.
- **3. Adult learning** is understood as learning at the adult life stage, a stage of lifelong learning in various forms and settings (formal, non-formal and informal). In this context, adult learning is part of a sequence of learning activities accompanying the entire life from early years to advanced old age. Skills that individuals possess, develop and acquire play a key role in adult learning understood in this way. In the strategic documents (2030 Integrated Skills Strategy), development of skills (basic, transversal, vocational/professional) is closely linked to lifelong learning and its various settings.

According to EUROSTAT, the AET participation rates for adult Poles have remained below the EU average for many years.

The most frequently offered types of non-school continual education are training workshops, courses, and seminars or conferences. Slightly more than 1/3 of trainings providers dispose of their own premises – lecture rooms, workshops; other institutions resort to rented rooms. The most offered topics of courses are transport (driving courses included), computer skills, lessons of foreign languages, management and administration and so-called "soft" skills (development of personality and professional career).

# Legal Framework 7.2

Continuing education (CE) is defined in the Law on School Education (consolidated text of 18 May 2021, item 1082; Article 4, section 30). Since 2013, efforts have been taken to embed in the field of education terms which are convergent with European definitions concerning lifelong learning, including adult education and training. At that time, the Government adopted new strategic documents, 'The Lifelong Learning Perspective' and 'The Human Capital Development Strategy, which defined basic policy terms for lifelong learning. The key factors in making lifelong learning a reality are skills and conditions and opportunities created for skills development as these are necessary for social capital enhancement, economic growth and high quality of life. As a major step in devising an Integrated Skills Strategy (ISS) in 2019, Poland adopted a general part of the ISS: a document developed in close collaboration between the ministries concerned and stakeholders (Integrated Skills Strategy 2030 (general part), Warsaw, 2019, Ministry of National Education; accessed July 2020). Another document relevant to adult education in the context of adult skills is the OECD Skills Strategy Poland: Assessment and Recommendations, OECD Skills Studies (OECD Publishing, Paris, 2019) (accessed August 2021). In December 2020, the detailed part of the 2030 ISS was developed, which refers to the OECD document (accessed August 2021).

In the context of energy literacy, the role of educating the society in the field of effective and ecological ways of meeting thermal needs is emphasized in the "Energy Policy of Poland until 2040" (PEP 2040). It is emphasized that all other activities mentioned in EPP 2040 must be accompanied by the improvement of knowledge about rational energy consumption through various educational activities – it is necessary to raise public awareness of the potential of energy savings in homes and workplaces – e.g. rational heat management, effective fuel combustion, use of energy-saving lighting and RTV/household appliances, methods and effects of thermal modernization. An important element will be energy consultancy at the local level, as well as activities (e.g. campaigns) promoting energy saving, including energy audits.

# Main goals & methodology 7

7.3

Main goals of Polish national State-of-the-art report of mapping the existing educational offers and competences in the field of energy literacy for (young) adults are:

To identify the present conditions in Poland related to energy literacy for adults and educational options for them. All seminars, workshops, trainings and projects where adults can gain competencies are described in a following section. Measures are aimed at local government workers, factories workers or generally towards adults.

To review energy topics and issues that are the main focus of different types of educational offers. Popular topics are: energy efficiency in buildings, RES and finances.

To identify the existing training materials regarding energy literacy in Poland, websides, e-courses, but also teaching methods used on face-to-face or online, but conducted in real time courses. Most educational offers propose providing an abundance of information in a short period of time.

#### Methodology:

Adult energy education programs in which the PNEC was involved or known to us were revied. In addition, searches were performed based on popular search engines, e.g. Google. The programs and the project were assessed using their official websites:

https://www.stepenergy.eu/pl/

https://etykietaenergetyczna.pl/

https://www.energy-aid.pl/uslugi-kompleksowe/szkolenia-personelu/

https://szkoleniaoze.com.pl/szkolenia-stacjonarne-z-pomp-ciepla/szkolenie-dla-doradcow-energetycznych/

https://doradztwo-energetyczne.gov.pl/oferta-doradcow http://www.pnec.org.pl/pl/together-library http://www.pnec.org.pl/pl/56-together/together-spotkania-i-wydarzenia http://www.pnec.org.pl/pl/rebus http://www.enpover.eu/en/

# Educational offers 7.4

## TRAINING FOR CANDIDATES FOR MUNICIPAL POWER ENGINEERS

7.4.1

Local government units may submit participants who will be trained in a wide range of issues related to energy efficiency and renewable energy sources. Municipal Power Engineer is a person whose task will be to support the implementation of investments in the commune and thus reduce energy consumption, reduce air pollution and create new sources of renewable energy. An important area of activity is also raising the awareness of the inhabitants of the commune, among others on the causes and effects of air pollution. Municipal Power Engineer supports not only the commune but all entities in its area, including entrepreneurs, housing cooperatives and communities as well as natural persons. The scope of the training covers 26 thematic issues carried out within 42 hours over 6 days and is divided into three blocks:

Block 1	Legal conditions - 9 topics, 14 hours.	
Block 2	Technical knowledge - 7 topics, 14 hours.	
Block 3	Financing and implementation of investments - 10 topics, 14 hours.	

A person for training is reported by the commune head, mayor, president. A participant may be: an employee of the local government who deals with EE as part of his duties or who will be entrusted with such duties after the training, as well as a person who is not an employee of the local government, who after the training will be employed in the local government and will perform the above-mentioned duties.



### TRAINING FOR ENERGY ADVISERS

7.4.2

Two-day training in theory and practice, the aim of which is to acquire knowledge and skills in the field of building energy analysis and selection of heating devices (with a focus on air/water heat pumps). The skills that the participant will acquire are: identification of the customer's heating needs, identification of the structure and properties of the building, identification of heat losses in the building, recognition of existing heat sources and type of installation, analysis of the building's energy demand, analysis of the possibility of using an air/water heat pump in the building, selection devices for specific conditions, identification of the device's ability to work with a PV system. The training lasts 2 days, 8 hours a day.

### The program includes:

- basics of the construction of residential buildings,
- analysis of heat losses in the building,
- types of heating and hot water systems,
- building inventory,
- energy audit and energy performance certificate,
- basics of selecting a heat pump based on power characteristics,
- cooperation of a photovoltaic system with a heat pump,
- case study and summary.

## EDUCATIONAL CAMPAIGN FOR CONSUMERS IN CONNECTION WITH THE RESCALING OF ENERGY LABELS, ENTITLED "NEW LABELS. TIME FOR CHANGES!" 7.4.3

An event was prepared for people who plan to buy household appliances with new labels, without pluses that characterized previous labels. The aim of the campaign is to present new energy labels and to present the benefits of investing in equipment with a higher energy class, for the benefit of the consumer's wallet and the environment.

The organizer, the Association of Employers of Household Appliances (APPLiA) also created an informative website <a href="https://etykietaenergetyczna.pl/">https://etykietaenergetyczna.pl/</a>. The website provides detailed information on the new energy labels as well as an explanation of why the labels have changed.

### REBUS - RENOVATION FOR ENERGY EFFICIENT BUILD-INGS

7.4.4

The aim of the project was to help local governments to improve the energy efficiency of public buildings by designing a model "pathway for energy renovation of buildings", including exemplary solutions in the field of planning, implementation and monitoring of renovation works carried out in buildings belonging to the city/municipality, as well as involving in this process key stakeholders.

As part of the project, a series of trainings "Saving energy in buildings - education and activation of building users" was conducted for representatives of local governments interested in improving energy efficiency of public utilities by changing the behaviour of their users and actively involving them in energy management processes.

Project website: <a href="https://www.interregeurope.eu/rebus/">https://www.interregeurope.eu/rebus/</a>

## TOGETHER - TOWARDS A GOAL OF EFFICIENCY THROUGH ENERGY REDUCTION

**7.4.**5

The project was aimed at helping local governments from Central and Eastern Europe to plan the optimal path to reduce energy consumption in various types of public buildings.

As part of the project, 12 training courses were conducted on the following topics:

Assessment of the building's initial energy situation.

Energy modernization of the building shell, modernization of the heat source and internal installations (including the lighting installation); adaptation of the operation of internal systems after thermal modernization; passive and plus-energy buildings in national conditions

RES installation in public buildings, with particular emphasis on the use of local renewable energy potential, including solar collectors, photovoltaic panels and heat pumps.

EU and national funding programs (including POliS, RPO, NFOŚiGW), PPP, EPC, EPIC, PICO, renewable funds, municipal financing, energy clusters, selection of optimal financing for specific types of projects.

Development of good quality project documentation (business plan, budget, application for financing); ensuring the bank acceptability and profitability of the project, economic and financial evaluation of the investment/activity.

Public procurement, green public procurement, competitive dialogue, communication with the selected contractor and supervision of its work.

Psychological and sociological background of user behaviour; types of public building users and their impact on the building's energy consumption; insufficient knowledge, approach, practice (KAP gap); rebound effect, NIMBY (Not In My Back Yard) approach and ways of dealing with these phenomena.

Effective communication with building users; non-investment/behavioural energy saving measures; conditions to be met to enable energy savings; possible/model incentive systems, including 50/50.

User involvement levels; innovative methods of activating users and their deep involvement in energy planning and energy management processes.

Energy data monitoring: data collection, verification and analysis; methods and tools; technologies; intelligent measurement systems.

Using energy data to (1) optimize energy consumption; (2) changes in the behaviour of building users; standard and intelligent energy management systems; building energy management systems.

The use of information and communication technologies (ICT) to optimize energy consumption in the building; integration of different types of energy saving measures.

Project website: <a href="https://www.interreg-central.eu/Content.Node/TOGETHER.html">https://www.interreg-central.eu/Content.Node/TOGETHER.html</a>

## ENPOVER - MUNICIPAL LOW-COST ENERGY EFFICIENCY MEASURES TO ALLEVIATE ENERGY POVERTY

746

The EnPover project aimed at alleviating energy poverty of vulnerable households by engaging municipal actors in the process.

Polish awareness raising campaign in 3 Polish pilot cities has resulted in increased energy awareness of vulnerable citizens and teach them what kind of no-cost and low-cost energy efficiency measures they can implement in their households to reduce energy consumption and energy bill. In this aim ready to use kit with posts with graphics, which contain general slogans encouraging to change behaviour and specific actions to be taken, as well as interesting facts are placed in the content of the posts. To inform residents what kind of activities their cities take to support energy saving films for each of the 3 project cities have been prepared. Thanks to them, citizens are aware of the measures that the municipality undertakes on its territory to improve the energy efficiency of both public and private buildings, how it supports citizens in the energy transition of its buildings, or the use of renewable energy sources for the residents' own needs. Leaflets and posters created within the project and distributed among the involved cities are aimed to inform the residents about no- and low-cost energy saving measures to reduce their energy bills.

Among others a special website has been created for each of the project cities Residents visiting it will be able to directly open the dedicated page which includes news with the most up-to-date information on the city, energy saving, reduction of utility bills, legal changes, as well as a set of ECO tips for citizens to easily reduce their energy consumption and bills

and a library full of inspiring and informative links, such as an energy savings calculator, an energy price calculator, a consumer guide to the new energy labels, an app that helps to buy for and compare electrical appliances for cost of ownership or a ranking of the most energy-efficient products on the market.

Project website: <a href="http://www.enpover.eu/en/">http://www.enpover.eu/en/</a>

### TRAINING IN ENERGY EFFICIENCY

7.4.7

Trainings for technical service personnel carried out at the customer's premises in an industrial plant (for employees of machinery and building maintenance, company energy specialists) in the field of energy efficiency, with an emphasis on methods of achieving energy cost savings. The main goal of the training is to familiarize staff with the factors influencing energy consumption and to identify area-specific ways to increase energy efficiency and reduce operating costs. The training may last from 1 to 3 days and is preceded by a visit to prepare practical classes.

The training is prepared individually to the thematic scope chosen by the client on the following topics:

- Energy management systems the method of using measurement data to reduce energy consumption,
- Production process if the process is typical and known in the professional literature, not individual and highly specialized,
- Boiler room and heat distribution networks as well as domestic hot water ways to increase the efficiency of the system,
- Power generators, cogeneration, trigeneration,
- Distribution of electricity power transformers, energy losses, the impact of reactive power on energy losses and additional distribution fees, i.e. how to reduce losses on the entire volume of electricity supplied to the plant,
- Cooling units ways to increase the efficiency of the system by regulating the operating parameters of devices, numerical determination of the effectiveness of machines,
- Pumps, fans ways to increase the efficiency of the system by using highly efficient machines and speed control,
- Compressed air ways to increase the efficiency of the system by using appropriately selected machines as well as optimizing operating parameters and removing leaks,
- Vacuum system overview of solutions and factors influencing energy consumption,
- Lighting ways to reduce energy consumption by using new technologies and advanced control,
- Buildings factors influencing heat losses and gains.

### **STEP (SOLUTIONS TO TACKLE ENERGY POVERTY)**

7.4.8

Online training aimed at energy advisers of organizations that have direct contact with consumers. This course is available on the MOODLE platform and aims to promote knowledge and create communities that share the acquired knowledge. This training aims to train organizations to help energy poor consumers save energy and improve their standard of living and advise consumers on how to use energy more efficiently and how it can help them save money and improve their health and well-being.

### Training scope:

- Basic knowledge of the energy sector how the energy sector works, who are the main players, relevant laws and health effects resulting from thermal discomfort and poor indoor air quality.
- Home Energy Home energy efficiency, including behavioural changes, energy labels and certifications, building renovations, heating equipment, and energy use by lighting and household appliances.
- Better informed consumers Consumers' rights in the energy market, manage consumption and understand bills so that strategies can be implemented to reduce energy consumption and save on energy bills.
- Energy poverty: support mechanisms basic principles and functioning of the social security system in Poland, approach to the problem of energy poverty and support available in Poland for consumers in the situation of energy poverty.
- Personal data protection and consumer referral to STEP advisers.

# Identifying gaps 7.5

In Poland there are no projects, programs or courses aimed directly at young adults (29-39 years old) that are starting or are already creating their own households (and raising young children). They can only use and gain benefits from projects aimed at adults in general. Moreover, existing projects in most cases only engage with the specific group, e.g. local government employees, which clearly shows that adults creating their own households are not a priority for now, despite them being in a need of gaining key competencies and understanding of the energy-literacy principles to become more responsible and sustainable energy consumers and act as role models for children. There should also be noted that it is extremely important due to the fact, that in formal education due to lack of time and competencies teaching energy-literacy principles is often postponed or skipped, therefore young adults may have lacks in their knowledge, while they have to become main energy-

literacy teachers for their own children.

According to EUROSTAT, the AET participation rates for adult Poles have remained below the EU average for many years. It could mean that in will be harder to promote adult education in Poland, but it could also mean that there is a great need for useful and accessible forms of providing young adults with knowledge.

Poles are generally not acquainted with national documents about energy strategies, consumption and production, as well as with EU directives and strategic documents as Green Deal. They do not know where to find national and European directives. Providing this knowledge should be included in legal document, moreover it should not be only mentioned as in PEP2040, but it should be presented with a plan involving specific actions. Legal documents are also incomprehensible to the average recipient, therefore increasing their knowledge will positively affect the level of understanding of energy-related documents. EL-Practice we will give a special attention in developing interactive and accessible energy literacy knowledge and competencies e-course via mobile-friendly platform, especially focusing on young adults to foster positive energy related behavioural changes in order to

literacy knowledge and competencies e-course via mobile-friendly platform, especially focusing on young adults to foster positive energy related behavioural changes in order to co-create a sustainable Europe we all want. The most similar to other projects is the way of sharing knowledge (online), but it is crucial to emphasize that most of the platforms are not mobile-friendly, therefore they are harder to use in day-to-day life for young adults, which relay heavily on their mobiles.

Also mapping of the existing competencies and knowledge levels of young adults will enable bridging the gap that can be seen in current educational offer on the topic of energy. The course programs vary considerably and without information on the state of knowledge of young adults, it is impossible to determine which topics are the most important and which energy education should focus on. Thanks to this, young adults will receive knowledge that is more tailored to their needs and, unlike the knowledge obtained during the courses, thanks to the platform they will be able to return to it, rather than being overwhelmed with a large amount of information in a short time.

EL-practice should be able to improve current situation and face many issues identified in Poland. It can be a great tool for young adults to find information about the interesting aspects and give them a chance to obtain the knowledge at their own pace. Providing young adults with necessary knowledge will result not only in increasing their energy literacy, but it also in a better energy education for their future kids, because due to the state of formal education (no tie or competencies), children have to learn good energy habits at home.

## Annexes 7.6

Polityka energetyczna Polski do 2040r. (PEP 2040)

https://eacea.ec.europa.eu/national-policies/eurydice/content/adult-education-and-training-56\_pl OECD Skill Studies. https://www.oecd-ilibrary.org/education/oecd-skills-studies\_23078731



# 

## Introduction

8.1

Slovenia is a European country, sharing land borders with Austria, Italy, Hungary, and Croatia. The capital of Slovenia is Ljubljana. Slovenia has about 2 million inhabitants<sup>1</sup>, and it is one of the European countries with the most pronounced ageing of the population, which is due to a low birth rate and increasing life expectancy<sup>2</sup>. The primary language is Slovene. Croatian (37%) is the most widely used second language, followed by English (34%), German (27%) and Italian (7%)<sup>3</sup>. The Slovenian education system consists of primary, secondary, and tertiary education. School leaving qualifications are classified by the Slovenian Qualifications Framework (SQF)<sup>4</sup>.

At the national level, the primary responsibility for adult education and training lies with the Ministry responsible for education<sup>5</sup> and its Upper Secondary, Higher Vocational and Adult Education Directorate. The central piece of legislation in the field is the Adult education Act<sup>6</sup>. This act regulates non-formal education and learning of people who have fulfilled their primary education obligation and do not hold the status of a pupil or a student. According to this act, adult education is provided on the basis of the national long-term master plan adopted by the National Assembly of the Republic of Slovenia. The current Adult education Master plan was adopted in 2013. The vision of this Master Plan is to enable every adult in Slovenia to have the same possibilities for quality education in all periods of life. According to the Master Plan, the adult education framework is presented in Table 1.

The network of adult education providers comprises specialised adult education institutions as well as various organisations that offer adult education as a supplementary activity. They include units for adult education in basic schools, upper secondary schools and higher education institutions; adult education centres called folk high schools; third age universities; educational centres in business companies and other organisations whose main activity is not education; privately owned adult education institutions and private, not-for-profit institutes; associations, libraries, museums, galleries; chambers of commerce, chambers of craft and small business and other chambers; and driving schools (which are under the domain of the Ministry of the Interior). More information about the main providers is available at Main Providers<sup>7</sup>. You can find information about the main types of the provision on Main Types of Provision<sup>8</sup>.

<sup>1</sup> http://www.eurydice.si/publikacije/The-Education-System-in-the-Republic-of-Slovenia-2018-19. pdf

Zupanič, Milena (20 June 2011). "Demografski preobrat: tiha revolucija med nami". Delo.si (in Slovenian). Delo, d. d. ISSN 1854-6544

<sup>3</sup> https://languageknowledge.eu/countries/slovenia

<sup>4</sup> https://www.gov.si/en/topics/slovenski-solski-sistem-in-slovensko-ogrodje-kvalifikacij/

<sup>5</sup> https://www.gov.si/en/state-authorities/ministries/ministry-of-education-science-and-sport/

<sup>6</sup> http://pisrs.si/Pis.web/pregledPredpisa?id=ZAKO7641

<sup>7</sup> https://eacea.ec.europa.eu/national-policies/eurydice/content/main-providers-74\_en#AEproviders 8 https://eacea.ec.europa.eu/national-policies/eurydice/content/main-types-provision-74\_en#AE-Programmes

Publicly subsidised adult education programmes target basic skills; programmes aimed at achieving a formal educational qualification; programmes targeting the unemployed or those at risk of becoming redundant; and liberal (popular) adult education programmes. Several adult education programmes that cover the area of basic skills have been developed through public funds. An important centrally developed framework programme is training for success in life. This framework programme aims to increase literacy among adults, strengthen their social skills and encourage active citizenship. There are currently five specific programmes implemented within this framework. Other relevant programmes include digital literacy, project learning and language programmes. There are also adult education programmes that have been specifically designed for migrants.

Adults can also achieve all levels of formal educational qualifications. Acquiring basic school academic qualifications is a legally guaranteed right and is free of charge at any age. Adults who wish to complete upper secondary education may enrol in regular upper secondary education programmes with special organisational adjustments. They fulfil the requirements regarding previous education or any formally adopted special conditions for enrolment. Adults can also enrol in all levels of tertiary education programmes as part-time students.

Adult education and training targeting the transition to the labour market are organised within the broader framework of active labour market policy under the Ministry of Labour, Family, Social Affairs and Equal Opportunities authority. Employment Service<sup>9</sup> offers access to several programmes targeting registered unemployed jobseekers. Three forms of liberal/popular education have continuously received public funding: study circles, centres for independent learning, and learning exchange.

	CATEGORY	KNOWLEDGE	RECOGNITION
Priority	Formal/non-formal	Programme	Certificate
1	Non-formal general education	Publicly recognised programmes (literacy and essential skills)	Publicly recognised certificate
		Other courses, seminars, lectures	(optional) unofficial certificates issued by programme providers
2	Formal education to acquire primary education	Basic school for adults	Basic school certificate
	Formal education to acquire upper secondary and tertiary qualification	Upper secondary (vocational, technical and general) education  Part-time short-cycle higher vocational studies	Final vocational school certificate  Mastercraftsman examination certificate  Vocational matura certificate general matura certificate  Tertiary education certificate
3	Formal education for labour market needs	Supplementary education, specialisation	Vocational qualification  Mastercraftsman examination certificate
	Non-formal education for labour market needs	Active labour market policy programmes, training, preparatory courses for exams leading to national vocational qualifications	Unofficial certificates issued by programme providers

# Legal Framework

Energy policy is the basis for a competitive economy in Slovenia. It must fulfil the conditions of environmental sustainability and a reliable and competitive energy supply. Priority areas are energy efficiency and increased use of energy from renewable sources. In Slovenia, we promote environmentally sustainable energy solutions to become a low-carbon society. The Republic of Slovenia's comprehensive national energy and climate plan<sup>1</sup> provides several instruments in training, education, information and energy and climate literacy with a total value of about 17 MEUR/a. This is intended to improve general energy and climate literacy and increase household activity in terms of energy efficiency through measures in the area of subsidies for energy efficiency and renewable energy sources. Additional measures in energy poverty will be needed to encourage about 25% of passive households to become energy efficient and adopt RES. This is because, in addition to knowledge and awareness, the activity or passivity of households is also influenced by their financial situation.

The Slovenian Qualifications Framework (SQF)<sup>2</sup> is a uniform system of qualifications in the Republic of Slovenia, which aims to outline the educational and other qualifications available in Slovenia and the mutual comparability of different qualifications. Its basic function is to clarify the horizontal and vertical relationships between different types of qualifications, certificates, and degrees/diplomas. They consist of level descriptors, each level descriptor defined by learning outcomes.

The Energy Act (EZ-1) of the Republic of Slovenia<sup>3</sup> defines the requirement that all new buildings must be near-zero energy. In this law, the term "near-zero energy building" means a building with very high energy efficiency or low energy demand for operation. Most of the energy needed is generated from renewable sources on-site or nearby. The action plan for near-zero energy buildings contains targets and programmes, measures to achieve these targets and human and financial resources to implement these programmes and measures. The new situation in which educational institutions and other adult education providers find themselves due to the new coronavirus epidemic also shapes the education offered to adults. Numerous measures and guidelines from the Ministry of Health<sup>4</sup> and the National Institute of Public Healt<sup>5</sup> to prevent infections with the new coronavirus have presented adult education providers with significant uncertainties and challenges in planning, organising and delivering educational programmes. Distance education had not been systematically established and developed before the Covida 19 epidemic, with some exceptions, so adult education providers had to adapt quickly to the new conditions

https://www.gov.si/zbirke/projekti-in-programi/nacionalni-energetski-in-podnebni-nacrt/

https://www.gov.si/en/topics/slovenski-solski-sistem-in-slovensko-ogrodje-kvalifikacij/

<sup>2</sup> https://www.energetika-portal.si/fileadmin/dokumenti/publikacije/an\_snes/an\_snes\_slovenija\_en.pdf

https://www.gov.si/drzavni-organi/ministrstva/ministrstvo-za-zdravje/

https://www.nijz.si/

and approach adult education differently. In planning the provision of education, priority was given to formal adult education, public service and education related to contractual obligations. The offer of non-formal adult education was more petite, especially that which was not compulsory from either the education participants or the educational organisations. Currently, there are no targeted activities in the field of education in energy efficiency, renewable energy and sustainable mobility to increase energy literacy in companies, municipalities and public administration. A few cities in Slovenia<sup>6</sup> are implementing a programme of information activities to increase energy literacy at all levels. Indeed, outreach and education activities are crucial for successfully implementing EUE and RES measures and mainly through soft content (consultation, education and communication). The main stakeholders are Public administration staff, pupils, students, professional groups in the energy sector (contractors, engineers, etc.), and households. Energy efficiency, diversification of energy sources, the introduction of renewable energy sources, overcoming energy poverty, energy literacy and information, strategic partnerships, and development and innovation to create new green jobs are crucial for long-term energy planning in communities. The expected results are lower energy consumption for heating, hot water and cooling, a higher share of renewable energy sources and greater energy literacy among the population.

Slovenia also promotes a global calculator<sup>7</sup> for calculating energy and climate futures. The free interactive online tool enables the creation of energy and climate scenarios up to 2050. Experts developed the global calculator from more than ten international organisations. They have created a model of the worldwide energy, climate, space and food systems until 2050 and offered it as a free interactive online tool. The calculator allows interested citizens to check how different lifestyles (from kilometres travelled per person to calorie consumption, food, energy, materials and space) will affect reaching and achieving our climate, energy and other goals. Calculations under some global calculator scenarios have shown that by 2050 the goals of simultaneous economic development and slowing climate change can be physically achieved. The world has enough energy, land and food resources for us all to live well. Today's technologies, fuels and farming methods are already advanced enough to achieve economic development goals and even reduce the impacts of climate change. On the other hand, the global calculator has limited access to all geographical details and only presents average consumption per person globally and not per country, so twenty countries have already modelled their national calculators on its model. In Slovenia, there are already initiatives to create a national calculator that would help in the formulation of energy and climate laws.

Some initiatives strengthen energy literacy in Slovenia, primarily through organised events and projects. The need to enhance energy literacy has been recognised especially by professionals from different fields, decision-makers, young people, teachers and professors, and the media. The desire to improve energy literacy is also perceived at universities among natural and social sciences students.

# Main goals & methodology

Energy literacy is an understanding of the nature and role of energy in the world and daily life, accompanied by the ability to use that understanding to answer questions and solve problems. An energy competent person knows how to follow energy flows and think about energy systems. Such a person is aware of their energy use. They know precisely the source of energy. An energy literate person can assess the credibility of energy information and can easily communicate meaningfully about energy and energy use. They can make informed decisions about energy use to understand the impacts and consequences.

Our research aims to show important segments of education for strengthening energy literacy. The descriptive method of empirical pedagogical research was used as the basic research method. We proceeded from the principles of qualitative research.

Data were collected by analysing various documentation:

- from the analysis of various documentation (leaflets, annual reports, development reports, investment programs, rules, statutes, schedules, invitations, textbooks);
- from website analysis (search terms: energy literacy, adult education and learning)

When reviewing the content on energy literacy, we included all the results in the search engine with the keywords "energy literacy" or "energy literacy". We reviewed the catalogue of the Center of the Republic of Slovenia for Vocational Education and Training at the level of vocational education<sup>8</sup> and other higher vocational education programs for adults. In further research, we focused on diplomas, subjects or titles related to energy literacy, energy management, environment, circular economy, sustainability, educational curricula, and news. In this way, we reduced the number of search results and limited them to the search area. We have defined the search topics comprehensively and concisely.

Below are the main developments in developing strategic documents in energy literacy in Slovenia. Edini višješolski študijski program, ki je vsaj malo povezan s temo energetske pismenosti je predmet elektroenergetika<sup>9</sup>, vendar po pregledu vsebine ugotavljamo, da vsebina energetske pismenosti ni vključena v program. The current situation in Slovenia regarding energy literacy could be described as an initial phase. Not many measures have been taken to intensify the integration of these issues in secondary and higher education. We used search engines to review educational programs and policies on energy literacy.

https://cpi.si/poklicno-izobrazevanje/izobrazevalni-programi/programi/vsi/#elektroenergetika

https://cpi.si/poklicno-izobrazevanje/izobrazevalni-programi/programi/vsi/#elektroenergetika



# Educational offers 8.4

To determine and summarise the current situation in Slovenia regarding energy literacy, we reviewed the existing curriculum and legislation on these topics in Slovenia. In informal education, we know several projects in energy, such as Energy Saving School, Eco-School, Young Geniuses, etc. Recently, in non-formal education, more and more institutions in Slovenia are dealing with energy literacy and offering various educational projects that help increase energy literacy.

In the following, we will present examples of good practices in sustainable energy that contribute to increasing energy literacy and work at different levels in Slovenia. The examples serve as an overview of activities in energy literacy strengthening in practice.

## **PROGRAMME ENSVET**

8.4.1

The ENSVET Energy Advice Network for Citizens<sup>10</sup> programme provides free energy advice on efficient energy use in households. It supports all home and flat owners who intend to invest their money in reducing energy consumption. The counselling takes place under the auspices of the Eco fund with qualified energy counsellors. It is organised in the form of a network of energy counselling offices throughout Slovenia. The aim is to improve the thermal insulation of buildings, the use of more modern heating appliances and the increased use of renewable energy sources, thus contributing to the protection of the environment, the reduction of energy costs and the improvement of living conditions. The programme was introduced in 1991 in the form of a project and has been irrevocably implemented since 1993. The programme includes advisors who are qualified to provide advisory services in energy efficiency. There are 35 advisory offices in Slovenia, where 65 certified advisors offer their services. Their main task is to help all homeowners who intend to invest their money in reducing energy consumption with free advice and talks on planning and implementing measures for more efficient energy use. By operating offices throughout Slovenia, the partnership cooperation with the municipalities is demonstrated. The energy advice is free of charge for all Slovenian households. The project is fully funded by the Ministry of Environment and Spatial Planning.

## **LOCAL ENERGY AGENCY DOLENJSKA-POSAVJE-BELA KRAJINA (LEAD)**

Local Energy Agencies are organisations that promote and encourage the continuous improvement of energy efficiency and the accelerated introduction of the use of renewable energy sources in each region. Currently, there are seven local energy agencies in Slovenia. Local energy agencies were established under the European Intelligent Energy Europe (IEEE) programme. The agencies are also partly financed under this programme. As an example, we present LEAD - Local Energy Agency Dolenjska-Posavje-Bela Krajina<sup>11</sup>. The agency's mission is to promote and actively cooperate in renewable energy use, efficient energy use and sustainable development of the environment at the local level. Its task is to advise on the development of municipal energy concepts, energy studies, energy audits of buildings and other energy projects, and to inform citizens through the media about the possibilities of efficient energy use and the use of renewable energy sources and new technologies in the energy sector. The agency's activities include organising round tables, workshops and press conferences in the field of energy, mentoring clubs in schools, assistance in preparing applications for co-financing of projects in the field of energy, expert evaluation and advice on energy investments in the region. Calls for tender with an explanation of how these funds can be used or obtained

## **SLOVENIAN E-FORUM**

The Slovenian E-forum is an association for energy management and ecology whose mission is to support processes that improve energy services and access to them while reducing the negative impact of energy conversion on the environment, nature and society. The association has been active since 1993 and brings together experts in energy process planning and management, energy and environmental policy, energy economics, economic instruments of environmental protection, public participation in environmental protection processes, efficient production and use of renewable energy sources and activists. The association is a founding member of the Environmental Centre, the Club for Sustainable Development and the Centre for Non-Governmental Organisations of Slovenia, a member of the international climate protection network Climate Action Network Europe (CAN Europe) and the sustainable energy network INforSE, and a member of the Climate Alliance. Associations of climate responsible municipalities. The association organises thematic expert meetings and public debates, expert lectures and guided examples of good practice, public discussions on legislative and programme documents, and participation in legislative and programme records in energy, environmental protection, and climate change at the national and European level. The association is very active in innovative awareness-raising and educating young people about climate change, efficient use and deployment of renewable energy sources, and promoting efficient energy production and service and renewable energy sources in communities. Some of their important projects are: Energy Paths, FEEDU - Children Change Energy Culture, PRIME - Private Investments Drive-Eco energy, REALISE - Forum, Eco Fund helps reduce CO2, Our school lowers CO2.

# 8.4.4 EN-LITE PROJECT

In order to strengthen energy literacy, the ENLITE project <sup>12</sup> was launched in 2014. The project argues that knowledge about energy and energy and understanding its importance for our daily lives is necessary for responsible and fact-based shaping of Slovenia's energy future. So far, more than 70 experts from natural sciences, engineering and social sciences have participated in the project. They work as amateurs, and most content-related work is done voluntarily. Through sponsorships and donations, they mainly cover the costs for external contractors, such as designers and IT. We have never had any problems recruiting experts to give talks or participate in discussions and interviews to prepare or review content. This indicates a great willingness among experts to improve the understanding of their field among the general public. The project involves a variety of experts, from physicists, biologists, geologists, and climatologists to energy professionals (electricians, mechanics, etc.) and a wide range of social scientists, from economists, sociologists, political scientists, urban planners, architects, communicators, etc. The experts contribute their knowledge and essential data from their field of expertise to the project, thus helping to strengthen the energy literacy of the citizens. Within the project, various lectures and workshops in energy literacy are organised (e.g. Energy Literacy Week), and translations of world literature in the field of energy and energy knowledge have been published.

#### **ENERGY LITERACY SOCIAL NETWORK**

8.4.5

The European Energy Literacy Social Network (SEOP) project is an example of an educational project that has developed an international course on energy literacy. The project was launched in 2014 as part of the Lifelong Learning Programme. The project aims to improve people's awareness and knowledge about energy, the environment and sustainability through interactive learning modules and educational opportunities. The course consists of four modules that can be accessed through the web portal. The teaching on the portal is based on innovative pedagogical approaches, the use of interactive applications and enables e-learning in English. In order to allow students with lower English skills to follow the lessons, a summary of the modules in Slovenian with a translation of the main content of the whole course has been created on the portal.

## **ESVET - ONLINE HUB ON ENERGY**

8.4.6

An online hub on energy<sup>13</sup> was launched at the end of 2014 to strengthen the energy literacy of different target groups. The platform is a product of cooperation between GEN energija d.o.o. and professional partners, including the University of Maribor, the Jožef Stefan Institute, ELES, d.o.o ARAO - Radioactive Waste Agency. The main objectives of the eSvet platform are to increase energy literacy and awareness among visitors. The energy and energy-related website present a combination of video, animation, image and content components, with the help of which it presents the problems and challenges of the energy future of Slovenia, the EU and the world. The educational topics cover energy in general, nuclear power, hydropower, fossil energy, other energy sources and the energy future. The information offered is professionally sound, presented in a friendly and understandable way and supported by interactions.

# WEB COMMUNICATION FOR PROMOTING ENERGY LITERACY IN SLOVENIA

Web communication is one of the key opportunities for strengthening energy literacy in Slovenia. A brief overview of the Slovene Web reveals that today there is no comprehensive, educational and awareness-raising Website devoted to energy issues to promote energy literacy. However, many Websites cover specific energy-related aspects, e.g. energy efficiency, energy-efficient buildings, renewable energy sources, energy consumption in transportation, nuclear energy, nuclear power plant operation, radioactive waste, etc.

The Slovenian energy company GEN energija, in partnership with several sciences, research and expert institutions, initiated a Web project called eWorld (eSvet) to offer Web users a broad spectrum of energy-related knowledge based on the essential principles of energy literacy. eWorld will present information interactively using infographic material. Company GEN energija

In 2011, GEN energija<sup>14</sup> opened an interactive visitor centre, the World of Energy, to increase energy literacy and awareness. The main aim is to increase the interest and knowledge of all key stakeholders in energy content. Knowledge and understanding have a strong influence on the perception of the challenges related to the energy supply of today and tomorrow. They, therefore, play an essential role in the social acceptance of the strategic development projects of GEN. In addition to strengthening energy literacy, the Energy Council also strives to awaken young people's interest in science and technology. Thus, indirectly, they promote enrolment in technical and scientific education programmes in the medium term to enable GEN to select suitable personnel for planned development projects.

After reviewing courses, training and best practices, it was found that energy literacy is not

- 13 https://www.esvet.si/
- 14 https://www.gen-energija.si/

# 8.4.8 COURSE ON ENERGY LITERACY

Study programme and level: Extracurricular activity

Prerequisites: Basic knowledge of mathematics and physics is recommended.

#### The content of the course:

- Energy sources
- Energy conversion principles, energy transmission and energy consumption
- Renewable energy sources
- Distributed energy production
- E-mobility in transport
- Energy policy and legislation
- Efficient use of energy
- Energy-classification of buildings
- The energy performance certificate of buildings
- Zero-net energy buildings

Objectives and competencies: understanding the basics and applying the acquired knowledge.

- understanding of energy conversion principles and E-mobility in transport;
- application of energy transmission, energy consumption and renewable energy sources:
- determination of energy classes and energy performance certificate of buildings.
- Use and develop the ability of independent and creative solving of engineering problems.

#### **Intended learning outcomes:**

Upon completion of this course, the student will be able to:

- of energy-efficient design in the energetics,
- to use energy policy and legislation and integration of the process of optimisation when solving applicable projects.

#### Transferable/Key Skills and other attributes:

- solving concrete examples under the supervision and hence developing student's creativity, logical thinking and the ability to economically efficient designing,
- autonomy in professional and research work.

Learning and teaching methods:

Lectures: the student gets acquainted with the theoretical content of the subject. Tutorial: the student upgrades the theoretical knowledge with practical experience.

## FACULTY OF ENERGY, UNIVERSITY OF MARIBOR

8.4.9

**Topics within the defined program:** Circular economy and energy technology, 2nd level elective

#### In-depth content of identified topic:

- General concepts in the field of the linear and circular economy.
- The normative framework of the circular economy.
- Sustainable management of energy resources and waste transformation into resources
- Sustainable urban development, building construction and mobility.
- Energy and energy efficiency in the economy and the public sector.
- Costs for the efficiency of the technological solutions of the circular economy.

Students get to know the basics of transition to the circular economy, the sustainable management of technological solutions, and the cost-effectiveness of the implementation. With the lectures, the student gets acquainted with the theoretical content of the subject. In the tutorial, the student up-grades the theoretical knowledge with practical experience. For homework, students conduct a short study or project regarding the thematic of the subject. They do written examinations, oral examinations and homework.

# ENERGY LITERACY PROJECT

Energy literacy receives little attention in the literature. However, it is essential for Europe's economic and environmental future. It needs to be an integral part of the curriculum to achieve energy literate citizens. The Energy Literacy project targets young people rather than adults. The critical factor in this process is education in the early stages, as the younger generations are the future decision-makers, entrepreneurs and leaders. By implementing energy-related activities, young people will thus become ambassadors of the EEU and RES. Their knowledge and behavioural changes will also have a more significant impact. By increasing awareness and promotion of EEU and RES and their impact on the environment, and by highlighting examples of good practice in this area, we would like to encourage institutions »Energy literacy - establishing an online platform for awareness, education and promotion of EEU and RES« to become more involved or engaged in the aforementioned areas and thus, by raising awareness and educating children, also contribute to the achievement of national goals in the field of efficient energy use, renewable energy sources, low-carbon society and sustainable development.

The project's objectives are to promote the integration of energy literacy into the education system, which will have an impact on increasing energy literacy throughout society. The projects aim to educate students to become informed citizens who can independently participate in social dialogue. This dialogue is essential in their immediate social environment (family, school). It enables them to change existing patterns with the help of knowledge resulting from improved energy literacy.



# Identifying gaps 8.5

yet widespread in Slovenia. There is currently no course focused on energy literacy for adults at the adult level in Slovenia. There is no formal structure of courses at the secondary level in Slovenia that would allow students to develop their knowledge of energy literacy. Despite significant improvements in environmental topics (e.g. circular economy, sustainable development) and the provision of formal courses for secondary and higher education, Slovenia continues to perform poorly. The current educational offer on energy literacy is relatively scarce. Therefore, the EL Practice project also promotes and disseminates energy literacy information.

Educational programs dealing with energy literacy are still in their infancy in Slovenia. At the same time, there are few initiatives to introduce entrepreneurship to young people in Slovenia. However, these are only optional electives usually not included in the compulsory curricula. Secondary schools still have many opportunities for a more intensive introduction to energy literacy.

As there is a lack of knowledge in energy literacy, the project EL Practice will improve Slovenia's educational offer and competencies. Accordingly, adults will be offered courses that demonstrate energy literacy's importance, benefits, and dimensions. Courses encourage adults to use these skills to improve their knowledge, employability and entrepreneurship. In Slovenia, adults can only take a few courses in energy literacy and acquire informal skills. Adults will be trained and knowledgeable about energy literacy topics by disseminating the EL Practice project results. Formal inclusion of these topics in the curriculum is still in its infancy in Slovenia, so it is necessary to educate people through non-formal education.

After reviewing previous energy awareness activities for adults and the current level of knowledge in this area, the results show that the energy literacy of adults is very low. That means that they do not know the price of electricity, electricity consumption, and individual appliances' consumption. The first step towards improvement is to assess the current situation. As part of the project LIFE IP Care4Climate<sup>15</sup>, a survey on household energy-efficient behaviour was conducted at the Jožef Stefan Institute in the Centre for Energy Efficiency<sup>16</sup>. Participating households answered questions such as "What is the cost of electricity for a washing machine for one wash cycle in EUR?" and "What is the average electricity consumption in kWh?" And "How much energy in % can we save if we use LED light bulbs instead of halogen bulbs with the same brightness?". The survey results show that energy literacy is very low, especially compared to financial literacy. Most people answered the questions on energy literacy incorrectly, while the situation is the opposite for financial literacy.

This means that they are well aware of the effects of inflation and interest rates and the time value of money. Still, they do not know the price of electricity, their consumption and the consumption of individual appliances. We reduce energy consumption and thus emissions with a minimal financial investment. Small acts are the measures that every individual can take without digging deep into their pockets. Some measures are entirely free, while others require a minimal financial investment. These actions are spread across many areas and usually have little impact on individuals. Still, together they have a relatively large potential. Therefore, the effectiveness, persistence and overall impact of implementing such measures depend on energy literacy and awareness. After all, it is difficult to do something and insist on it if we do not know the effects and the significance of our actions. That is why imparting knowledge is so important in addition to advice.

Energy Efficiency Survey in Slovenia (REUS 2015<sup>17</sup>) was carried out in our region. One of the most well-known surveys was conducted to obtain helpful information on energy consumption in Slovenian households Energy. The survey has conducted a face-to-face and an online survey. The last REUS survey showed a shift towards energy efficiency. It did not detect a gap between actual and declared attitudes, which was strongly observed in previous surveys.

When analysing cooperation in energy literacy with different partners in the environment, we found that most of the collaboration occurs at the local level. The local environment allows access to energy literacy content for other groups. Slovenian and European opinion polls<sup>18,19</sup>, show that energy literacy in Slovenia is generally low. The knowledge of Slovenians is still primarily based on the understanding of general energy concepts. Still, there is little knowledge about issues of energy production, energy efficiency, renewable energy sources, energy future and investment opportunities in Slovenia. Research has shown that society is insufficiently informed about energy-related issues and strategic directions in this field, and the possibilities for energy saving.

<sup>17</sup> See summary of results REUS 2015: http://www.energetika-portal.si/fileadmin/dokumenti/novice/reus2015/

<sup>18</sup> Eurobarometer »Energy Technologies: Knowledge, Perception, Measures«; European Commission (2006)

<sup>19</sup> Eurobarometer »Europeans and Nuclear Safety«, European Commission (2006)





# HIGHLIGHTS

By conducting national analyses of state-of-the-art and reviewing existing educational offers, we can gain the most important insights:

The educational offers of the project can fill a gap and bring more equality and heterogeneity into the field of adult education in energy literacy.

The project educates staff and a group of young adults in energy literacy by developing interesting, dynamic micro-trainings on the platform. Today's education needs to be made more meaningful in the curricula through real-life examples and relevant case studies.

The energy literacy project is specifically designed for young adults and provides a comprehensive training programme to help address the lack of education on energy issues.

The project can provide an excellent tool for young adults to learn about the exciting aspects and allow them to increase their energy literacy.

As there is a lack of knowledge in the field of energy literacy, the project will improve the educational offer and skills. Accordingly, courses will be offered to adults to show the importance and benefits of energy literacy.

# ENERGY LITERACY-PRACTICAL TRAININGS FOR SUSTAINABLE ENERGY CONSUMPTION VIA PERSONAL BEHAVIOURAL CHANGES

The Association of Municipalities Polish Network "Energie Cités", Kraków, Poland INNOVATION HIVE, Larissa, Greece

International Institute for the Implementation of Sustainable Development, *Maribor, Slovenia*North-West Croatia Regional Energy Agency, *Zagreb, Croatia* 

LEVILO - Association for ecological and social sustainability, *Graz, Austria*The Energy Agency of Savinjska, Šaleška and Koroška region, *Velenje, Slovenia* 

