

## Result 3.5

### Training programs for strong learners in initial vocational training

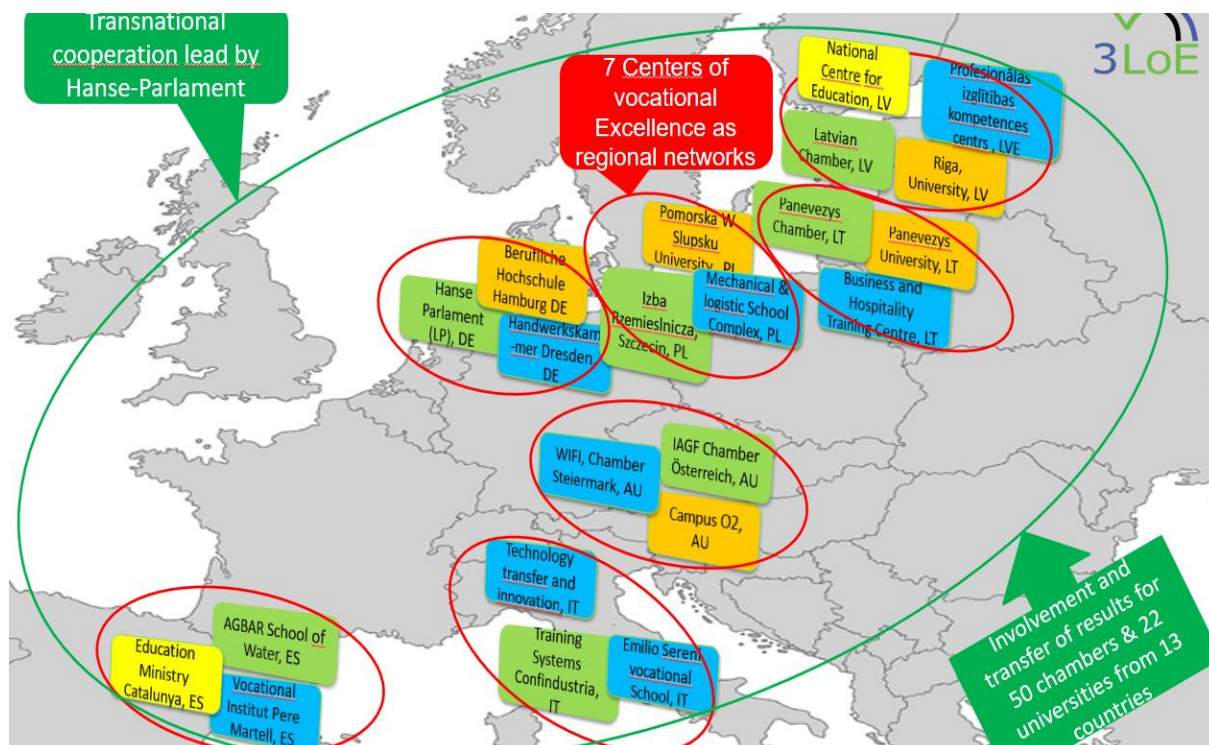
## Implementation and Evaluation



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## Partner



## Language

English

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## Project Summary and Introduction

### About the 3LOE project

Around 99% of all EU businesses are SMEs, creating up to 70% of all jobs. In general, SMEs have good growth prospects for the future and are particularly well equipped to solve environmental problems and to enhance the green economy. However, in most of the project countries, SMEs are confronted with a shortage of skilled workers and young entrepreneurs. This shortage of skilled workers is even more alarming taking into account that due to aging of current entrepreneurs, a large and growing number of companies will have to be handed over to the next generation. Furthermore, young specialists and entrepreneurs often lack the qualifications and skills needed in order to respond to contemporary developments in the fields of energy, climate and environmental protection. The following problems have been identified in SMEs working in the fields of green economy, energy and environmental protection:

- Blatant and growing shortage of skilled workers.
- Large qualification deficits, especially in the Green Economy.
- Loss of attractiveness and low qualification of school-based VET.
- Low rates of further training and insufficient orientation of offers to SME needs.
- Ageing of entrepreneurs and increasing shortage of young people (demographic change).
- Failure of business transfers and low rates of business start-ups.
- Low innovation rates and insufficient productivity.
- Not enough cooperation between universities and SMEs and a lack of teaching geared to SME needs.
- Comparably low internationalization of SMEs and vocational training providers.
- Lack of national level support for SMEs”.

To meet these challenges, work-based learning and new paths in vocational training must be provided through cooperation between educational institutions, economic chambers and SMEs. University graduates are often well-qualified in theory, but lack practical knowledge, skills and abilities that are crucial for SMEs. For this reason, VET reforms must also involve higher education and should implement dual bachelor's degree programs that combine a bachelor's degree with vocational training and on-site work in companies.

In the 3LOE project, an innovative and complex project structure with 22 project partners from 7 countries as well as 60 associated partners from 13 countries was designed. In each country, centers of vocational excellence (COVEs) in Green Economy will be established, managed and their permanent continuation ensured. A transnational cooperation of the centers will be developed, extended to 60 education stakeholders from 13 countries and operated permanently in an institutionalized form. The centers will offer a wide range of dual education measures in vocational training, further education and higher education, that are being developed, tested and evaluated in the project. These educational measures on EQF levels 3-7 focus on Green Economy, Digitalization and Entrepreneurship. Furthermore, vocational and educational consulting and innovation support for SMEs will be developed and implemented. In total, seven Train-the-Trainer programs will be developed and implemented permanently by the project partners. All results will be transferred to the 60 associated partners together with implementation advice.

The objectives and aimed outcomes of the 3LOE project can be summarized as following:

## **1. Foundation of a three-level Center in each project country**

1.1 Building the "Green Economy" skills alliance for qualifications in SMEs with educational and economic actors from the 7 project countries; development of information and cooperation tools.

1.2 Expansion of the skills alliance to the 60 associated partners from 13 countries, comprising chambers of commerce, SME associations, as well as universities of applied sciences/colleges.

1.3 Development, testing and evaluation of a curriculum and teaching materials for Train the Trainer courses for personnel and center management (vocational school-teachers, trainers in SMEs and lecturers in further and higher education institutions).

1.4 Evaluation of the construction and operation of the seven centers of Excellence and of the transnational cooperation.

1.5 Development of business and financing plans and ensuring the long-term continuation of the seven centres and transnational cooperation.

1.6 Development, consulting and introduction of political strategy program.

## **2. Implementation and realization vocational training**

2.1 Development and implementation of a tool for vocational and qualification counseling as well as a training for consultants and teachers to use the tool.

2.2 Implementation of the dual system, so that work-based learning is put into practice in the project countries.

Preparation and transfer of curricula and examination regulations for dual vocational training for different professions and implementations in Poland, Lithuania, Latvia and Spain.

Development, test and implementation Trainings for teachers to conduct dual vocational training as well as Training of trainers in SMEs.

2.3 Development political concept for the training and integration of young people with learning difficulties for young people with learning difficulties (EQF level 3).

Development, test and implementation of a dual vocational training "Specialist for Building Insulation".

2.4 Development, testing and evaluation of education programme, teaching materials and examination regulations for the provision of sector-specific qualifications already during the initial vocational training for stronger learners. Implementation in the dual system, so that work-based learning is put into practice in the project countries.

2.5 Development and implementation five-year technician training „Ecologic Solutions in Logistics”.

## **3. Implementation and realization of further vocational training**

3.1 Development and implementation of concepts and instruments for the management of continuing vocational training.

3.2 Development, test and implementation of a Train-the-Trainer program for teachers to conduct further training.



3.3 Development and implementation of a concept "SME-fair digitalization" as well as development, test and implementation of two train the trainer programs "Basic and advanced digital skills".

3.4 Transfer and implementation of four further trainings Energy Saving and Renewable Energies.

3.5 Preparation, transfer and implementation of six further trainings in the Green Economy.

3.6 Development, testing and evaluation of different training programs and teaching material for owners, managers and qualified workers of SMEs (EQF level 5 and 6). The trainings are specifically tailored to SME needs and different qualification levels and combine the transfer of technical, professional and management know-how.

- Training Enterprise and Entrepreneurship in Green Economy
- Training Energy Service Manager
- Trainings vocational Master Carpenter and Electric
- Training Construction Technician
- Training Service Technician
- Training Sustainability in foodservice industry

3.7 Development of regulations for new continuing education occupational profiles with a focus on the green economy.

3.8 Development of an integration programme for the unemployed (EQF level 4) in order to be able to place the unemployed in permanent jobs through further training seminars and a further training qualification.

#### **4. Implementation and realization of higher education**

4.1 Preparation and transfer of curricula, evaluation and examination regulations for two existing dual Bachelor degree programmes "Management of Renewable Building Energy Technology" and "Business Administration for SMEs".

4.2 Development and beginning of implementation of new dual Bachelor degree programs

- Business Administration & Sustainable Management of SMEs
- Entrepreneurship and Innovation in Green Economy
- Logistics - Green Supply Chains
- Service technician
- Tutorial "Sustainable management Climate neutrality for companies"

4.3 Development, test and implementation of four study modules (EQF level 6) on SME management in the Green Economy sector, which will be carried out in the dual study system and integrated into existing Bachelor degree programmes.

4.4 Development and implementation of concept for innovation promotion Solutions for manageable R&D tasks of SMEs and conducting manageable R&D projects for SMEs-

4.5 Development, testing and implementation of Training program for university lecturers and SME advisors.

## 5. Dissemination, transfer and use of the project results

5.1 Development of a concept and summary evaluation of the dissemination results of all partners

5.2 Transfer of all educational measures to 60 educational institutions in 13 countries and needs-oriented implementation consultations as well as realization of a bundle of measures for further dissemination of the project results.

5.3 Further dissemination activities such as presentations online, at third-party events, press releases and conferences.

5.4 Book with all results of the project and distribution via book trade.

For each of the three levels of educational measures there will be:

- Target-group-specific educational programs.
- Curricula, teaching materials, etc. developed in a leading role by the educational institutions of the respective level, whereby the educational institutions of the other levels (in particular universities) participate in an advisory and supportive manner.
- Representatives of the participant target groups involved in the development work.

All educational measures will be tested with the respective target groups under different national conditions in the countries, evaluated and completed on the basis of the evaluation results with application notes.

## About the training programs for strong learners in initial vocational training

The 3LOE project aims at promotion of work-based learning by introduction of dual vocational education and training, especially in countries with school-based vocational training. Dual training has proven to be particularly effective, however, attention should be paid to observe individual abilities and possibilities and better adapt to youth with different educational backgrounds, competencies, skills and learning progress, such as:

Level 1: Two-year training for youth with practical talents with a recognized degree (EQF Level 3)

Level 2: Three-year practical and theoretical training, completed with a recognized qualification as skilled worker/journeyman (EQF Level 4)

Level 3: Three- to three-and-a-half years training for overachievers, including additional qualifications, completed with a recognized qualification above the examination level of skilled worker/journeyman (EQF Level 5)

Strong learners as well as trainees with proper training achievements in intermediate examinations can be granted a shortening of the regular vocational training time by up to one year. Such shortening is to be limited to half a year, while the second half of the year should be invested in transferring skills in technology and management of the Green Economy. In a sense, this is comparable to an early training, delivered already during vocational training.



Regardless of ways of shortening the training period, additional qualifications can be imparted during the regular training period or, alternatively, upon completion of vocational training.

Imparting additional qualifications allows for

- attracting skilled workers who have already acquired in-depth knowledge and skills in environmental techniques during or immediately upon vocational training.
- prompting stronger learners (e.g. with Matura (Abitur) or school leaving certificate (intermediate level)) towards completing vocational training that will be equivalent to advanced training qualifications and will serve as a door-opener to perfect career opportunities.
- to increase the attractiveness of vocational training, to attract young people with stronger learning abilities to vocational training and thus to meet the high qualification requirements and to make an effective contribution to overcoming the high and growing shortage of skilled labor in the future.

Learning results are based at EQF Level 5. Additional competencies and skills imparted during vocational training (EQF Level 4) are largely inter-occupational. Only selective modules are job specific. The project will address in particular young people who are undergoing vocational training in relevant occupations, for example:

- specialists in wastewater technology
- specialists in recycling and waste management
- specialists in water supply technology
- plant mechanics for sanitary, heating and air conditioning technology
- gas and water fitters
- plumbers.

Following the example of VET, additional qualifications should be offered, if applicable, in a dual VET-system. To this end, in the project seven key modules will be developed, with the following scope of training:

- A Technologies in water supply
- B Technologies in water saving
- C Greywater and rainwater utilization technologies
- D Decentralized wastewater treatment technologies
- E Fundamentals of the circular economy
- F Systemic solution-oriented consulting

Participants may complete selective or all main modules, and for each completed main module an attendance certificate will be issued. Participants who complete all trainings are entitled to an advanced training exam with the degree “Environmental Consultant in... (followed by the name of the qualified occupation)”.

As part of the project, curricula and teaching materials for six training courses were prepared and transferred to all COVEs, which were trialed and evaluated in various countries. This ensured that the different national conditions were already taken into

account during the development and implementation of the activities, thus promoting their application in the different countries.

The six curricula with teaching materials were transferred electronically, made available on Google drive and published on the project website for permanent use by all interested parties.

The implementation reports of the various training courses, an evaluation concept and evaluation reports are listed below.

## Implementation Training Technologies water supply

### Departament D'educació- Generalitat de Catalunya<sup>1</sup>

#### 1. Introduction

The main objective of the course “water supply technologies” is to introduce an environmentally conscious perspective of qualified professionals in the field of water supply technologies to attending course participants. Thereby, the participants are able to obtain qualifications in the field of sustainability in water supply technologies.

The testing has been 100% presential. The contents of the curriculum were adapted into the current curriculum for a Higher Degree in water management. The sessions were developed in the afternoon during the months of September and May. The training was taught by two trainers so that each of them could offer their personal experience in terms of water supply technologies.

Even though most of the students in the course had some knowledge about water in their lives, the aim to provide participants with knowledge about water access, the necessity of sustainable water management and water saving to transform their own personal or business activities or consult others in these areas. In this sense, they have been doing different challenges in order to find different situations where they can act to improve tomorrow.

The curriculum was adapted and translated into Catalan. It was a blended type of training: the course comprises of 74 contact hours with the trainer and 46 hours of individual learning. Of the total contact hours, they have been distributed as follows among the modules of the current curriculum: M02\_Water quality and treatment (24h), M03\_Efficient water management (22h), M04\_Configuration of water network (28h).

#### 2. Admission and organization of the testing

The selection of the participants has been done between our students due to some of them are workers in different companies. They have to be representatives of pines and some experience as a qualified workers/ specialists in the environment.

One way to win over participants was to involve them in learning. On the first day the trainer asked them what their doubts were and also what their needs were. During the following sessions, all these issues were dealt with and solved. Another aspect that could be highlighted is that most of the examples and exercises were based on what they could apply at the company. One thing that really helped (which will be explained more in detail later on) was that the trainer worked in the water sector for several years and they had experience and training in environment, so they could explain different experiences applicable on a day-to-day basis in SMEs.

The contents and exercises have been prepared on an online platform (Moodle), but face-to-face hours have been respected.

The following trainers were active.

- Eduard Fernández de la Vega is an Industrial Technical Engineer from the Polytechnic University of Catalonia (UPC). With more than 30 years of experience in managing water distribution networks, he currently combines his functions as Head of the Operational Control Center of Aigües de Barcelona with teaching

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<sup>1</sup> Prepared by Gema Almagro, Institut Esteve Terradas

in the Higher-Level Training Cycle in Energy and Water, at the Esteve Institute Terradas, as well as in the Water School (AGBAR), in which he participates as an expert tutor in different professional training programs.

- Juana Teresa Cervera Valero is an Industrial Technical Engineer, specializing in Industrial Chemistry. He has a postgraduate degree in Food Technology. For years he has worked in different sectors such as the chemical or food sector. The environmental sector stands out as responsible for a laboratory in a WWTP, performing functions such as determination of operational and quality parameters, preparation of reports, control of ISO 9001 and 14001 documentations, among others. She currently works as a teacher at the IES Esteve Terradas i illa de Cornellà Institute.

The trainer explained the participants a lot of different experiences in order to be able to those situations than can be applied in each of the companies where they work.

### 3. Participants profile and organization of the training

4 women and 23 men took the training. They all are, as it can be seen in the chart below, some of them students and some of them, also workers.

The assessment was achieved by carrying out dynamic activities in class, carrying out group work and, finally, exposing the work to a panel (formed by expert teachers in the field). In this way, it was possible to verify the degree of assimilation of the contents worked by the participants.

The trainers adapted some of the contents on the curriculum to make them more accessible to the reality of Catalan workers in a Catalan company. They took advantage of some materials from her Postgraduate Certificate in Education (for example, the topic on the selection and hosting of apprentices according to the criteria established by the Department of Education of the Government of Catalonia). They also used the “Manual de tutores de empresa en la FP Dual” by the Bertelsmann Foundation and materials by other institutions such as the Consell General de Cambres de Catalunya (Chambers of Commerce Association) and the Alianza para la FP Dual (Dual Vocation Training Alliance). They introduced the topic of multiple intelligences and changed the individual learning styles and learning principles (project learning, problem-based learning, flipped classroom, etc.)

The participants now know how to apply knowledge in the field of sustainability in water supply technologies.

Here are the literal words of some of the participants:

“Thank you so much for the training and help. I think It will help us to carry out actions in accordance with the water supply technologies in our day to day”.

“A very interesting training. It has solved many doubts about what the water supply technologies really is and what actions to carry out”.

The participants mention that they will not be able to transfer knowledge as accurately as the trainers.

They have found it difficult to transmit all the knowledge received to the rest of the company's workers.

#### 4. Main Findings and Conclusions

Considering that the course has been carried out during the first course the work carried out by the students has been very satisfactory.

All the knowledge acquired will also serve to face the second year of the Higher Degree in water management.

The training has opened their eyes and has awakened their curiosity in a several aspects of water supply technologies.

The development of the curriculum should be more flexible so that it could adapt better to the social and working reality of each country.

We hope it will be continued at the same format. It has been adapted to the Catalan need and it would be a pity if it was not used again. Once it has been adapted, the curriculum could be aimed at any professional sector just by changing the examples.

## Implementation Training Technologies water saving

### 1. Izba Rzemieslnicza Malej i Sredniej Przedsiębiorczosci<sup>2</sup>

#### Legal basis

- Act of April 27, 2001, Environmental Protection Law (Journal of Laws 2021, item 1973, as amended)
- Act of July 17, 2009, on the system for managing emissions of greenhouse gases and other substances (Journal of Laws of 2020, item 1077, as amended),
- Act of June 15, 2018, amending the Geological and Mining Law and certain other acts (Journal of Laws of 2018, item 1563),
- Act of May 15, 2015, on substances that deplete the ozone layer and on certain fluorinated greenhouse gases (Journal of Laws of 2020, item 2065),
- Act of October 3, 2008, on the provision of information on the environment and its protection, public participation in environmental protection and on environmental impact assessments (Journal of Laws of 2021, item 2373, as amended)
- Act of July 20, 2017, Water Law (Journal of Laws of 2017, item 1566)

#### Date and place of training

25.01.2023 – 31.05.2023

Vocational school in Maszewo

#### Prerequisites for participants

The course was addressed to students of the vocational School of the First Degree in Maszewo studying the professions of electrician and fitter of buildings and finishing works in construction, who wanted to acquire knowledge and skills and improve their professional qualifications in the area related to the energy industry and the sector of renewable energy sources.

#### Learning objectives

The goal was to prepare course participants for work in the energy sector including renewable energy sources, and to increase their professional qualifications by:

- participation in theoretical and practical classes conducted by specialists.
- acquiring knowledge of the socially important topic of sustainable development in the energy sector.
- acquiring competencies that will allow them to take journeyman or apprentice exams.
- obtaining information on recent legal changes in the field of environmental protection.
- expanding knowledge in the field of interpretation of environmental protection regulations.

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<sup>2</sup> Prepared by Izba Rzemieslnicza Malej i Sredniej Przedsiębiorczosci, Poland



- acquiring the ability to practically apply legal provisions in water protection documentation.
- increasing competence in the area of water protection.
- getting to know trends in the water protection area.
- learning about electrical methods and devices used in water protection.

### Framework Plan of the Course

The course included 100 hours, 60 hours of theory and 40 hours of practice

1. operation of electrical installations, machinery and equipment up to 1 kV
2. installation of components of indoor electrical installations -.
3. carry out visual inspection and maintenance of indoor electrical installations under supervision
4. perform installation, visual inspection, maintenance and inspection of solar installations
5. to carry out the installation of photovoltaic installation elements, as well as its maintenance and periodic inspections

#### Target group

The course was attended by 8 people

All participants passed the internal exam and completed the course . They received Certificates of completion of the course issued by the organizer.

Participants took the state examination in the profession of electrician, 5 people received the title of journeyman, 3 people received certificates of passing the examination of verification.

Supporting documents: teaching logbook, attendance lists, copies of certificates of course completion.

### Description of learning outcomes

(1) Upon completion of the course, the participant acquired knowledge and skills on:

- (a) operation of installation of electrical machines and equipment up to 1 kV
- b) installation of components of indoor electrical installations
- c) carry out visual inspection and maintenance of indoor electrical installations under supervision
- d) perform installation, visual inspection, maintenance and inspection of solar installations
- e) perform installation of elements of photovoltaic installation and perform its maintenance and periodic inspection

(2) The participants of the course gained knowledge of socially important issues of sustainable development in the energy sector.

(3) upon completion of the course, the participant meets the formal criteria for taking the journeyman/professional examination in the electrician profession.

#### Method and form of completion

In order to complete the course, the following were required: attendance at theoretical and practical classes, passing the internal final exam.

8 participants successfully completed the course.

8 course participants took the journeyman electrician exam, 5 passed the exam and were qualified as journeyman electricians.

3 people took the examination for verification in the electrician profession.

Supporting documents: copies of journeyman certificates.

## 2. Institut Pere Martell<sup>3</sup>

### 2.1 Introduction

- Contextualisation within the overall project  
The main objective of the seminar is for the participant to be introduced and trained with an environmental perspective in the field of water saving technologies. In this way, participants can obtain qualifications in the field of sustainability in water saving technologies.
- How was the testing of the tool carried out, where and when  
The training was 100% face-to-face. The contents of the study plan have been adapted to the territory where the training takes place. The sessions took place during the months of March and April in the afternoon. The training was given by a single expert trainer in the subject to be treated.
- Significance of the tool  
Although most of the students in the course had heard about saving water, they did not have a deep knowledge of it. The goal is to provide students with knowledge and applications of water-saving technologies that enable them to implement improvements in both their personal and business activities.
- Special features of the implementation  
The curriculum was adapted and translated into Catalan. It was a 100% face-to-face training. Eight sessions of 4 hours each were held. The last part of each session consisted of different games to help assimilate what had been done during the day. And the first part of each session was a reminder of the previous session.

### 2.2 Admission and organisation of the testing

- Selection of participants, possible admission requirements  
The selection of participants was done in two ways:

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<sup>3</sup> Prepared by Marta Casanova, Institut Pere Martell, Spain

- Among our students since some of them are workers in different companies.
- It has been opened to the general public for all those who are interested as it is a topical issue especially in Catalonia at the moment due to the drought we are suffering.
- How were the participants approached and won?  
One way to win over participants was to involve them in learning. On the first day the coach asked them what their doubts were and also what their needs were. During the following sessions all these problems were discussed and resolved. Another aspect that could be highlighted is that most of the examples and exercises were fun and entertaining.
- Organisation of the implementation (face-to-face or online)  
The contents and exercises have been developed in google drive, but it was done 100% face-to-face.
- Brief notes on counsellors and teachers, their qualifications and experience  
Marta Casanova is an Industrial Engineer and has a Postgraduate Certificate in Education. She has been working as a teacher in VET schools for 3 years. She also worked in water treatment companies for 20 years, carrying out different functions: projects and projects and works planning, production and distribution of drinking water networks and sewage systems, among others.
- Brief notes on accompanying advice, support for participants, etc.  
The trainer explained to the participants many different experiences to be able to face those situations that can be applied to each of the companies where they work or will work.

## 2.3 Execution of the testing

3 woman and 12 men took the training, some of them students and some of them, also workers.

- Explanations and notes on implementation  
The assessment has been achieved by performing dynamic activities in class, performing exercises in small groups using AI, and finally, taking a final evaluation test.
- Observations and feedback from counsellors  
The trainer adapted some of the contents on the curriculum to make them more accessible to the reality of Catalan workers.  
The trainer comments the subject of the course is not so much to acquire knowledge but to raise awareness among the participants towards a responsible use of water and provide them with ammunition to be able to make this change. I believe that participants have learned to be agents of their own environment and can support others to reduce their water footprint and for their new water-saving lifestyle.
- Strengths of the tool as seen by the participants

The participants now know more deeply the problem of climate change and the need to save water and how from their daily life they can work to improve it by applying the knowledge acquired.

These are the verbatim words of some of the participants: "Thank you very much for the training and help. I think it will help us to carry out actions based on saving water in our day-to-day life."

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"A very interesting training. It has resolved many doubts about the drought we are experiencing and possible solutions for using water."

"Thanks. Now I know where the water comes from and how much it costs to get it home! I'll try to save as much as I can."

- Weaknesses of the tool as seen by the participants

Participants mention that they have knowledge to save water in their personal day-to-day life, but do not know how to apply it in their company, they will need someone with deep knowledge of their company to apply it. Most do not see themselves as capable of doing it themselves.

## 2.4 Main Findings and Conclusions

Considering that the full potential of the training could not be developed as time was limited, the overall results are highly valued, both by the participants and the trainer.

The training has opened their eyes and has awakened their curiosity in a several aspects of saving water.

The development of the curriculum should be more flexible so that it could adapt better to the social and working reality of each country.

We hope it will be continued at the same format. It has been adapted to the Catalan need and it would be a pity if it was not used again. Once it has been adapted, the curriculum could be aimed at any professional sector.

## Implementation Training Technologies decentralized waste-water treatment

### Sociedad General De Aguas De Barcelona<sup>4</sup>

#### 1. Introduction

The training program on "Resilient Strategies for Water Management in Response to Climate Change" is a crucial component within the broader initiative aimed at enhancing sustainability practices and addressing the challenges posed by climate change. In a world increasingly affected by environmental shifts and growing pressure on natural resources, effective water management is paramount to ensuring the resilience and sustainability of communities worldwide.

This initiative aligns with global efforts to achieve the Sustainable Development Goals (SDGs), particularly those related to water management and environmental sustainability. By equipping participants with comprehensive knowledge and practical skills, the training program contributes directly to building capacity in sustainable water practices.

Moreover, the program integrates theoretical learning with practical applications, facilitated by experts in the field during both self-directed study and in-person session. Participants not only gain insights into current wastewater treatment technologies and regulatory frameworks but also explore innovative solutions to environmental challenges.

The training program "Resilient Strategies for Water Management in Response to Climate Change" is structured to accommodate both self-directed learning and interactive sessions with experts. The modality primarily focuses on self-paced study complemented by in-person sessions held at:

Location: College of Industrial Engineers of Catalonia, Via Laietana, 39, Ciutat Vella, 08003 Barcelona.

Date: The in-person session is scheduled for 05/06, from 9:00 to 14:00.

This blended approach allows participants to delve into theoretical concepts at their own pace through specialized manuals and supplementary resources. The in-person session provides an invaluable opportunity for direct interaction with subject matter experts, fostering deeper understanding and practical application of sustainable water management strategies.

The program's schedule spans 100 hours, distributed over 3 to 5 weeks per module, enabling flexibility in learning while ensuring comprehensive coverage of essential topics. Continuous assessment activities and self-assessment tests further enhance learning outcomes, preparing participants to apply their knowledge effectively in real-world scenarios.

- By completing the seminar, the participant will obtain the following skills:

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<sup>4</sup> Prepared by Sociedad General De Aguas De Barcelona, Spain

- **Comprehensive Understanding of Sustainability:** Gain a holistic view of sustainability principles, specifically the role of water in advancing Sustainable Development Goals (SDGs).
- **Knowledge of Legislation and Strategies:** Acquire insights into relevant legislation, strategies, and action plans developed by various entities concerning wastewater treatment, with practical applications tailored for small enterprises.
- **Environmental Impact Assessment:** Understand the environmental impact of water pollutants and develop innovative solutions to challenges posed by wastewater treatment systems.
- **Proficiency in Wastewater Treatment Systems:** Familiarize oneself with diverse wastewater treatment systems and applied technologies. Propose operational enhancements using innovative tools and techniques.

Students who want to expand the competencies acquired in their studies regarding sustainability, SDGs, and wastewater treatment technologies. Professionals in the sector.

This course is primarily structured as self-directed learning, although it includes an in-person session with experts to delve into the most relevant topics. The self-directed learning is based on self-paced study where students acquire knowledge and develop skills and competencies autonomously and flexibly, setting their own learning pace. Students will understand the content through the review of specialized manuals, complemented by a series of assessment activities. These activities have been carefully designed to measure the level of achievement of the learning outcomes based on the course objectives. Additionally, other complementary resources are provided and encouraged to be consulted to enrich understanding of the content, achieving holistic and meaningful learning in the field of water management.

## 2. Admission and organization of the trainings

School of Water. created by Agbar in 2012, is the benchmark in training, awareness, talent development and knowledge in the field of water and the environment. Our activity is aimed at training for companies, administrations and professionals in the water sector, as well as for the general public. Thus, we develop training programs, promote dual vocational training in the water sector, develop environmental education programs and design exhibition, museum and hydraulic heritage projects. The training programs, whether those in our catalog or those custom-designed for companies, cover all areas of the complete water cycle; they use methodologies that facilitate a unique learning experience and immediate applicability in all key positions of an organization. Our approach combines the academic and technical rigor provided by 165 years of experience in integrated water cycle management and collaboration with the best universities, technical schools and business schools.

Official College of Industrial Engineers from Catalonia (COEIC). It is the professional organization of the Industrial Engineers of Catalonia, committed to the professional development of engineers. It represents engineers in the industrial field, defending the



profession and its interests, and regulating its practice. COEIC promotes the progress of engineering and deploys activities of a technical, scientific and cultural nature.

Participants in the seminar were informed by the web of School of water. They were able to register through the website of the center where the training takes place.

The following trainers were active.

Desirée Marín

- Current Position: Director of Innovation, AGBAR
- B.Sc. in Chemical Engineering from Universitat Politècnica de Catalunya (UPC)
- Master's in Water Management & Business Administration (UPC)
- Over 20 years of experience with a strong focus on circular economy and sustainability.
- Instructor at Universitat Politècnica de Catalunya (UPC) in Circular Economy, Life Cycle Assessment (LCA), and Sustainability.

Nicolás de Arespacochaga

- Current Position: Head of Operational Support, AGBAR Plants
- B.Sc. in Chemical Engineering from Universitat Politècnica de Catalunya (UPC)
- Master's in Environmental Diagnostics from Cranfield University (UK)
- PhD in Chemical Engineering Processes (UPC)
- Joined CETAQUA in 2008 as Area Manager for Water and Energy, focusing on Wastewater Recovery.
- Promoted to Operations Manager in 2019.
- Since 2022, serves as Head of Operational Support at AGBAR Plants.

### 3. Participants and organization of the training

6 women and 9 men took the training. They all are working in a technical department or technical company, and all are from Spain.

TERM	MODULE	CREDITS
22/04/2024 - 12/05/2024	M1. Introduction to Sustainability and Water	
		- Water resources: current situation and future prospects.
		- Water challenges.
		- UN-Water: policies, data, and actions.
		- Sustainability and Circular Economy.
		- Sustainable Development Goals (SDGs).
		- SDG 6: Clean Water and

		Sanitation.
		- Water Cycle in the SDGs.
		- Water Cycle and climate change.
13/05/2024 - 16/06/2024	M2. Innovative Strategies in Water Management	
		- European legal framework for water treatment.
		- Legislation and regulations at various levels.
		- The European Green Deal: objectives and initiatives.
		- Urban wastewater treatment in Europe.
		- Management of non-sewered sanitation systems.
		- Eco-factories: circular models for resource recovery.
05/06/2024	In-person meeting in Barcelona	- Reuse of reclaimed water: Legislation and challenges.

The seminar was very interesting for the debate and moments of reflection that were generated in the classroom. It should be noted that the teachers were experts in the subject and that the participants were very interested and specialized people. Very good academic level and a very participatory audience.

#### 4. Main Findings and Conclusions

Summary assessment of implementation: Overall Average 5

Overall Rating (5-1): 5

- The training met expectations.
- Overall rating of expert Desirée: 5
- Overall rating of expert Nicolás: 5
- Overall rating of the content and resources: 5
- Overall rating of usability in the workplace: 5

Percentage of Scores: 100% of the scores were:

\*) 5 = Very Satisfactory, 4 = Satisfactory, 3 = Neutral, 2 = Unsatisfactory, 1 = Very Unsatisfactory.

When we asked in an open form about the aspects to improve, the contributions has been:

- Desire for Longer Sessions
- Update Online Materials
- Requests for Site Visits

When we asked in an open form about positive aspects, the contributions has been:

- Clear Direction for the Future of Water Cycle Management
- Highly Interesting Training
- Updated and Interesting Presentations
- High-Quality In-Person Session with Expert Speakers

## Implementation Training Fundamentals of the circular economy

### 1. T2I - Trasferimento Tecnologico e Innovazione<sup>5</sup>

The study program involved students in two parallel fronts: the first front of learning and experimentation carried out directly by the instructor in class, and the second front of independent content development and evaluation of their activities with companies.

The lessons were conducted in various modes:

- Traditional introductory and in-depth lessons that we used to immerse the students deeply into topics related to Life Cycle Assessment.
- Educational visits to companies engaged in the collection and transformation of urban waste and waste from construction sites.
- Laboratory activities aimed at understanding the key themes of the circular economy (notably Lego Trade, which was an engaging interactive educational experience involving all students organized into groups using the Lego Serious Play methodology).
- Practical exercises guided by the instructor, aimed at contextualizing and analyzing the information collected during educational visits and students' independent activities (disposal costs, documentation for material disposal at collection centers, management methods for excavation materials, etc.).

The independent activities were carried out with guidance, with students assigned observation objectives for the practical tasks they performed during their training internships, followed by independent documentation through photographs and reports.

Educational materials were produced and made available based on a shared project on the Miro platform, accessible from both computers and smartphones. The main contents were also made available in PDF format through shared folders using the school's G-Suite. Many of the PDFs specifically created for the course were formatted for smartphone viewing, while other documents came from institutional sources and had the standard A4 format.

We aimed to follow the content sequence outlined in the project, with the only exceptions being special events (Lego Trade activity and an educational visit to the construction materials collection center), which were coordinated based on expert availability.

We covered the following modules:

- 1) Definition of the circular economy.
- 2) Phases of the circular economy.
- 3) Climate change.
- 4) Waste management.
- 5) Management of specific types of waste.

We are currently delving deeper into the practical management of construction site waste, focusing on excavation materials and the processes for managing asbestos findings on construction sites.

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<sup>5</sup> Prepared by T2I - Trasferimento Tecnologico e Innovazione Scarl, Italy

This will be the concluding phase of hazardous waste management.

Attached are some sheets and content we used, ranging from the famous Ellen Macarthur Foundation LCA diagram to the "smartphone-friendly" PDFs specially created to summarize certain specific aspects of Italian legislation.

#### Customization of Content for Construction School Students

The content offered in this training and in-depth program proved to be highly interesting from the early stages, as it contextualized the circular economy themes in terms of both "why" and "how."

As our institutions are geared towards training operational professionals in the construction industry, we felt the need to adapt the detailed topics to make them more relevant to construction site activities and the work these students are preparing for in their immediate future.

This adaptation was developed along two lines of work:

- Reduction of modules related to aspects more closely tied to product or material design and conception (Resources, Design, Production, and Reuse), with a primary focus on analyzing climate change under the perspective of tangible and prospective effects, and a reduced emphasis on international agreements in favor of explaining their institutional function and importance in influencing national policies.
- Development and enhancement of practical observation activities related to construction materials, their packaging, and the impacts caused by their management in the construction process.

This adaptation allowed us to immerse the students more deeply in the concrete activities and professional choices of construction companies, thereby increasing their observational, analytical, and decision-making skills necessary to understand and manage the construction process properly.

#### General Participation Data

The course consistently involved twenty students, all males. As described in the introductory chapter, the activities they engaged in were divided into two main groups:

- Collective activities, including lessons, educational visits, laboratories, and practical tasks.
- Individual activities, involving study, in-depth analysis of construction site activities.

The collective activities had an average attendance rate of 87% with no dropouts. The individual activities, being more flexible, were completed at 100%. Attendance records have been kept and are available if requested.

## 2. Verslo ir svetingumo profesinės karjeros centras<sup>6</sup>

### 2.1 Introduction

The course „Fundamentals of the Circular Economy“ is designed to provide additional qualifications on the European Qualification Framework Level 3 to 4. It primarily targets young people with strong learning skills for vocational training. Completing the course enables the participants to support others, especially small and medium sized

<sup>6</sup> Prepared by Verslo ir svetingumo profesinės karjeros centras

companies, to steer towards a more environmentally conscious approach to their personal and business objectives in order to generate a more sustainable world.

## 2.2 Organisation of the training

Business and Hospitality Training Centre „VESK“ offered the training “Fundamentals of the Circular Economy ” as an optional module for the students enrolled in different initial VET training courses. In total 25 participants piloted and completed the training in the period November 2022 – April 2023.

The total duration of the course was **144 hours** and included:

- 88 contact hours,
- 54 hours of individual learning and
- 2 hours of assessment.

The total of the following activities was implemented during the training:

- Contact hours (theoretical): joint activity of teacher and student, including the lectures, processing teaching materials, seminars and workshops required to learn the theoretical parts.
- Self-study times (individual work): individual study of the some topic or technical literature by the participant of the training programme without supervision or participation in the training group.
- Assessment hours: time to prepare for evaluation, including the time of the evaluation.

## 2.3 Competences acquired

ENVIRONMENTAL MOTIVATION	Acting and behaving to a set of reasons and facts to preserve materials, resources and products for the circular economy.
LEGAL KNOWLEDGE	Knowledge of EU documents regulating the implementation of the principles of the circular economy. Furthermore, the United nations Framework Convention on Climate Change (UNFCCC), Kyoto Protocol, Paris Climate Change Agreement, national regulatory requirements applicable to the waste management.
RESPONSIBILITY	Knowing, evaluating and comparing one's own and other behaviours, thoughts, values and emotions in the preservation of materials and resources to contribute to the circular economy.
CREATIVITY	Responding in a circular economy approach to a complicated situation to optimize resources and products in a new and original way and furthermore to develop innovate solution for our problems.
TAKING ENVIRONMENTAL INITIATIVE	Showing initiative and encouraging others in dealing with environmental behaviours to promote the principles of the circular economy.
VALUING ENVIRONMENTAL IDEAS	Identifying, analysing, measuring and considering ideas to face the challenge of resource preservation in the field of circular economy.



WORKING WITH OTHERS	Combining different contributions and finding ideas (also from outside of the environment) to create environmental value to reuse and optimise resources and products.
WORK SUSTAINABLE	Application of the most relevant environmental principles in the given scenarios.
SPOTTING OPPORTUNITIES	Making connections between ideas and concepts from different fields, linking different disciplines and ideas with a circular economy approach.
RISK MANAGEMENT	Assumption of the challenges, reducing risk to a minimum, accepting residual risks in order to succeed in critical situations.
ENVIRONMENTAL VISION	Develop a compelling and inspired vision or sense of the core environmental purpose and communicate this message to others. It contributes to a successful transition to a circular economy.

## 2.4 Content of the training

Number	Module Name	Content	Training Time	
			Contact Hours	Self-Study Time
I	Definition of the circular economy		10	6
	What is circular economy?	The participants acquire the basic facts and knowledge about circular economy. EU documents regulating the implementation of the principles of the circular economy (Report of the implementation of the Circular Economy Action Plan, Documents on the circular economy package) support the learning process. New business opportunities as well as case studies are part of this module.		
	Why is a shift towards circular economy important?			
	Principles of the circular economy			
	Aims, objectives and regulations			
	Opportunities for businesses			
II	Stages of the circular economy		36	20
II.1	Resources		4	2
	Primary raw materials	The participant knows the commonly use minerals in the industry (oil, metal ores, peat, dolomite, limestone, gravel, chalk, clay)		

	Secondary raw materials	The participant is aware of the common waste products (paper, glass, plastic, metal, etc.) and its procedures to convert them into secondary resources.		
	Secondary raw materials by composition	The participant knows the various consistencies of plastic, paper, glass, metals, wood and biological materials.		
II.2	<b>Design</b>		4	2
	Eco-design strategies for products	The participants gain knowledge on the following aspects: How to choose the better, more environmentally friendly and less hazardous materials. The importance of the reduction of the resources employed. Furthermore, optimization of production management, sustainable logistics, avoidance of end-of-life scenarios and the extension of the product life are part of this module.		
	Effects of Eco-Design	The participants receive best practise examples in eco-design strategies for products and discuss important ideas.		
II.3	<b>Production</b>		4	2
	Effective technologies applied in the production industry	One acquires knowledge on innovative and environmentally friendly technologies within this course.		
	Eco-labels	The participants are aware of the most important eco-labels and their regulations as well as some labelled goods and products.		
II.4	<b>Distribution</b>		4	2
	Types of packaging	The participants are able to classify packaging according to their purpose, type, use and material.		
	Labelling of the packaging	The participants are informed about the different labelling techniques of plastic, metal, paper, glass, textile and composite packaging.		
II.5	<b>Re-use</b>		8	4
	Zero waste concept	One gains knowledge on the zero-waste philosophy and movement.		
	Sharing economy	The participants are taught best practise examples of the sharing economy.		
	Possibilities of waste re-use	One is aware of the different re-using possibilities of the waste components, like plastic, glass, paper,		

		metal, wood, ceramic, concrete brick, car tires and so on.		
II.6	<b>Waste collection</b>		8	6
	Waste sorting	The participants receive knowledge on the advantages and disadvantages of the waste sorting process.		
	Glass, paper and plastic	The participants will be informed about the sorting system of the different materials in the respective country and the associated national requirements.		
	Biodegradable (organic) waste			
	Construction and demolition waste			
II.7	<b>Recycling</b>		4	2
	Advantages and disadvantages of waste recycling	The participant receives a common understanding of the waste recycling technologies and gets good practice examples of EU companies in recycling plastic waste.		
	Waste Recycling technologies			
III	<b>Climate Change</b>		8	4
	Consequences of air pollution	The participant is aware of environmental issues like global warming, acid rain formation, ozone depletion and so on. The impact on Europe and the world is also part of this Module. Furthermore, the action everyone can take are discussed in class as well.		
	International agreements and obligations of the parties	The participant is informed of the United Nations Framework Convention on Climate Change (UNFCCC), the Kyoto protocol and the Paris Climate Change Agreement.		
IV	<b>Waste management</b>		12	8
	Regulations of waste management	The participant gets familiar with the national regulatory requirements applicable to waste management.		
	Economic and financial measures for waste management	The participant knows funding and financial support procedures for environmental projects as well as financial measures for waste management.		
	Hierarchy of waste management	One gains knowledge on the principles of waste management.		
	Responsible consumption, waste reduction			
	Organization of waste	The participants learn the usage of waste catalogues, codes, quantification, waste storage and the related		

	management and accounting	accounting requirements for businesses.		
<b>V</b>	<b>Management of specific waste types</b>		<b>14</b>	<b>8</b>
	Household waste management	The participant gets educated on the requirements for the management of the specific waste types.		
	Biodegradable waste management			
	Packaging waste management			
	Construction and demolition waste management			
	Bulky waste management	The participants are educated on the requirements concerning bulky waste management.		
	Waste disposal in landfills	One is taught about the requirements and national regulations for setting up a landfill.		
	Using waste for energy production	The participant gets an overall understanding of the methods of the waste energy production and knows the positive and negative aspects of waste incineration.		
<b>VI</b>	<b>Management of hazardous waste</b>		<b>8</b>	<b>8</b>
	Properties that create hazardous waste	The participants are able to identify hazardous waste and are aware of the impact of chemicals on the environment and the human health.		
	Labelling of hazardous materials	The participants are informed about legal regulations concerning the labelling of hazardous materials and know the warning icons.		
	Management of electronic waste	The participants know the requirements for the specific waste component and the danger of improper handling.		
	Management of oil waste			
<b>VII</b>	<b>Assessment</b>		<b>2</b>	
		<b>Total</b>	<b>90</b>	<b>54</b>

## 2.5 Certification

The certificate of attendance was issued to all the participants based on the attendance rate and delivery of the final presentation. The general attendance rate of the participants was nearly 92%.

The certificate issued equals to non-formal and state-recognised certificate of competences corresponding to the qualification.

## 2.6 Impact and Continuity

The training course “Fundamentals of the Circular Economy” was well received by the students and teachers.

Starting December 2023 Lithuania launches a new digital education platform - the Individual Learning Accounts system, aimed for adults to learn and improve their qualifications. It will allow learners, as well as companies involved in the training and development of their employees, to have their own individual accounts, access remote career guidance services and funding for learning targeted at national priorities. The system will be open to all Lithuanian citizens, regardless of their job position, qualifications, age or professional experience. Only programs submitted by accredited providers that meet the quality criteria will be published in the system. The delivery of the training will be fully funded by the state. It is expected that more than 100 000 people will participate in skills development programs by 2030.

VESK is going to actively participate in the new training provision scheme for adults as it has the status of an accredited institution. The course “Fundamentals of the Circular Economy” will be included in the official training programs’ list.

## 3. Panevezio Prekybos Pramones Ir Amatu Rumai<sup>7</sup>

### 3.1 Introduction

The training is designed to provide additional qualifications on the European Framework Qualification Level 3 to 4. Specifically, for qualification of young people with strong learning skills for vocational training.

### 3.2 Admission and organisation of the training

The training was implemented at two VET centres of Lithuania - Utena Regional Vocational Training Centre and Panevezys Training Centre. Administration of the training centres were asked to form groups of stronger learners willing to attend this course. There were 20 students in Utena training centre and a group of 18 students in Panevezys.

Total number of participants: 38 (20 students in Utena training centre and a group of 18 students Panevezys). The age of all participants was under 20.

### 3.3 Execution of the training

The training was carried out as additional classes for stronger learners according to the Curriculum “Fundamentals of the Circular Economy”.

The content and duration of the curriculum was slightly modified by the teachers and adapted according to the needs, age and knowledge level of the student groups.

The methods used included lectures, group work, self-study, quizzes and visits to companies.

The training consists of 6 modules: Definition of Circular Economy; Phases of the Circular Economy; Climate Change; Waste Management; Management of specific waste types; and Management of hazardous waste. The participants became acquainted with principles and objectives of the circular economy, environmental issues caused by

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<sup>7</sup> Prepared by Prepared by: Panevezys Chamber of Commerce Industry and Crafts

climate change; studied various aspects of packaging design and labelling; learnt how different waste must be sorted, re-used or recycled, etc.

In addition to classroom lectures the students visited regional waste management companies as well as companies engaged in water supply and sewage treatment. This gave them a perfect opportunity to observe real processes of waste sorting and management, water supply and its treatment.

### 3.4 Main findings and conclusions

The participants stated that they had acquired new knowledge on different sustainability issues and could better understand how behavior of each individual can influence the ecological situation in general. They were happy they had received clear and practical information on proper waste sorting, its possible reuse and recycling. All participants said they would be able to use the gained knowledge in the future.

The curriculum „Fundamentals of the circular economy” is well prepared, clearly divided into parts with detailed description. The content covers all aspects of circular economy. If needed, the training can be adapted to country-specific context and modified taking into account specific needs of the participants, their previous experience and knowledge. The curriculum is accompanied by samples of teaching material.

The curriculum can be used by other providers of educational services as a whole or its separate parts can be used for organizing specialized short trainings.

## 4. Zespół Szkół Mechanicznych i Logistycznych im. inż. Tadeusza<sup>8</sup>

The ‘Fundamentals of the Circular economy’ training is a comprehensive educational programme that not only raises environmental awareness, but also equips participants with practical skills and tools to implement sustainable practices in their organisations. Through an interdisciplinary approach and interactive teaching methods, participants will gain knowledge and experience that will enable them to act effectively on environmental protection and sustainability. The training programme aimed to:

### Increase Environmental Awareness

Participants had the opportunity to gain knowledge about the impact of economic activities on the environment. They understood how the implementation of CIRCULAR ECONOMY principles could contribute to conserving natural resources, minimising waste and reducing emissions.

### Development of Practical Skills

The training was designed to develop participants' practical skills in designing, managing and implementing CIRCULAR ECONOMY strategies. Through workshops and simulation exercises, participants learned how to implement CIRCULAR ECONOMY principles in their companies and organisations.

### Promoting Innovation and Sustainability

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<sup>8</sup> Prepared by Zespół Szkół Mechanicznych i Logistycznych im. inż. Tadeusza



The training encouraged participants to think innovatively and supported the development of new business models that could contribute to sustainable development and environmental protection.

### Strengthening Professional Competences

Participants gained new competences that increased their value in the labour market. As a result, they were better prepared for roles related to resource management and sustainability implementation.

The training was based on several key assumptions to ensure its effectiveness and affordability for all participants.

The training covered various aspects of the circular economy, such as economic, environmental and social. This ensured a comprehensive understanding of the topic and allowed for multiple perspectives on the CIRCULAR ECONOMY.

The training programme included numerous case studies, practical workshops and simulation exercises. This enabled participants to apply the knowledge they had gained in practice, enhancing learning.

The training materials were based on the latest research, trends and best practices in the field of CIRCULAR ECONOMY. This ensured that participants gained knowledge that was up-to-date and useful in practice.

The training was delivered using interactive methods such as discussions, group work and Q&A sessions. This approach engaged participants and supported active learning.

The training programme was flexible and adapted to the level of knowledge and experience of the participants. This allowed the content to be tailored to the specific needs of different target groups, enhancing learning.

The training was designed not only to impart knowledge, but also to inspire participants to make sustainable changes in their organisations and daily lives. Participants were encouraged to take action towards sustainability.

Participants received additional materials such as scripts, case studies and access to online resources. These were intended to support them in the further implementation of CIRCULAR ECONOMY principles and to enable continuous improvement of the skills they had acquired.

Students from classes I, II and III of the logistics technician profile took part in the training. Thanks to an interdisciplinary approach and interactive teaching methods, the pupils gained knowledge and experience that enabled them to act effectively for environmental protection and sustainable development. A total of 107 students (32 from class III, 44 from class II and 31 from class I) were trained.

Module 1	Introduction to the Circular economy	General introduction to the circular economy Definition and concept of a circular economy.
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		History and development of the concept of circular economy. Key concepts and principles of circular economy.
Module 2	principles of circular economy	Detailed discussion of the circular economy principles The 'reduce, reuse, recycle' principle. Designing products according to circular economy principles. Minimisation of waste and efficient use of resources.
Module 3	designing closed cycles in logistics	Workshop on the design of closed cycles in logistics Examples of closed cycles in the logistics industry. Techniques for designing sustainable logistics processes. Case studies and simulations.
Module 4	practical applications of circular economy	Case studies Examples of companies that have implemented circular economy principles. Analysis of successes and challenges in circular economy implementation.
Module 5	strategies and business models in circular economy	Overview of strategies and business models supporting circular economy Business models based on renting and resource sharing. Life cycle management strategies. Examples of innovative circular economy companies and startups.
Module 6	waste management and recycling	Discussion of waste management methods Recycling and resource recovery processes. Waste separation and treatment techniques. Waste management practices in different industries.
Module 7	circular economy policy and regulation	Analysis of policies and regulations related to circular economy

		<p>National and international regulations related to circular economy.</p> <p>Policies that support the development of a circular economy.</p> <p>Impact of regulations on business operations.</p>
Module 8	closed loop economics	<p>The impact of circular economy on the economy</p> <p>The economic benefits of implementing circular economy.</p> <p>Analysis of the costs and savings associated with circular economy.</p> <p>Social and environmental economic aspects.</p>
Module 9	technological innovations in circular economy	<p>Overview of the latest technologies supporting circular economy</p> <p>Recycling and material processing technologies.</p> <p>Innovative solutions in resource management.</p>
Module 10	green supply chains	<p>Workshop on green supply chains</p> <p>Definition and importance of green supply chains.</p> <p>Management practices of green supply chains.</p> <p>Case studies and implementation analysis.</p>
Module 11	entrepreneurship and innovation in circular economy	<p>How to develop innovative enterprises according to circular economy principles</p> <p>Support for startups and small businesses.</p> <p>Examples of green entrepreneurship.</p> <p>Innovative business models in circular economy.</p>

After completing the 'Circular Economy' training, participants gained not only a deeper understanding of the concept of the closed-loop economy, but also the practical skills and tools needed to implement sustainability in their organisations. One of the main advantages of the training was the interdisciplinary approach and the variety of topics and teaching methods, which allowed participants to look at the topic of circular economy from different perspectives and understand its relevance for the environment, the economy and society as a whole.

[Participants gained](#)

Knowledge and practical skills: A detailed discussion of circular economy principles, practical workshops and case studies enabled participants to gain concrete skills in designing, managing and implementing circular economy strategies.

Business perspective: An overview of circular economy -supportive strategies and business models enabled participants to understand how circular economy principles can be integrated into businesses, which can bring both economic and environmental benefits.

Knowledge of policy and regulation: An analysis of policies and regulations related to circular economy allowed participants to understand the legal and policy context for implementing sustainability principles and to identify opportunities and challenges for future regulatory changes.

Inspiration for innovation: Workshops on technological innovation in circular economy and green entrepreneurship were able to inspire participants to explore new solutions and sustainable business opportunities.

In summary, participants had the opportunity to gain not only theoretical knowledge, but also practical skills and inspiration for environmental and sustainable development activities. The variety of topics and teaching methods made the training interesting and engaging for the participants, which contributed to the positive perception and satisfaction of participation.

## 5. Latvijas Amatniecības kamera<sup>9</sup>

### 5.1 Introduction

Upon joining the project “3LoE – Three-level centres of professional excellence: Qualification, entrepreneurship and innovation in the Green Economy”, one of the main educational goals of Latvian Chamber of Crafts was to gain and provide new knowledge and skillsets for employees and employers of SMEs, who make up a large part of the Chamber’s members.

For craftsmen, embracing the circular economy can be more than a shift in business practice; it can be a strategy that supports the long-term sustainability, resilience, and relevance of their trades. Unlike large-scale industrial manufacturing, crafts are rooted in skill, tradition, and an intrinsic appreciation for the materials used. This focus on quality and care aligns naturally with the principles of the circular economy, which seeks to extend the lifecycle of resources, reduce waste, and create sustainable systems. By integrating circular economy practices, craftsmen stand to gain in several meaningful ways. Craft trades often rely on natural materials—wood, metals, clay, glass, and fibers. However, these resources are finite and increasingly costly due to market demands and environmental regulations. The circular economy promotes using secondary raw materials and repurposed resources, helping craftsmen reduce reliance on scarce, costly primary resources. This approach conserves materials and reduces

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<sup>9</sup> Prepared by Latvian Chamber of Crafts

expenses, creating opportunities for craftsmen to produce sustainably without compromising quality.

Craftsmen are traditionally skilled in maximizing material use and minimizing waste, making their approach naturally compatible with the circular economy. Their ability to create high-quality, durable goods emphasizes the circular model of “design for longevity.” By embedding circular economy practices—such as designing for repairability or using eco-friendly, recyclable materials—craftsmen can promote their role as leaders in sustainability. This aligns with growing consumer interest in environmentally responsible products and sets a model for the wider manufacturing industry. This creates additional revenue streams, such as repair services, refurbishing, or leasing models, which are gaining popularity and allow products to be used over multiple lifecycles.

The circular economy encourages craftsmen to look at their materials, processes, and product lifecycles with fresh eyes. By adopting circular practices, craftsmen can be led to explore innovative techniques—like remanufacturing, upcycling, or eco-design—that refine their skill set and enable them to adapt to modern environmental standards.

Ultimately, by learning about circular economy principles, craftsmen can gain insight to a more sustainable future—one that respects resources, values quality, and honors the skills that set them apart.

## 5.2 Admission and organisation of the training

All participants taking part in the training were Latvian Chamber of Crafts members (self-employed persons or SME employees or employers).

The dissemination of information about the chance to participate in this course was done by phone and e-mail, as well as information on the Latvian Chamber of Crafts web page.

The training was attended by 15 participants.

The lecturer was chosen based upon previous cooperation and their experience with teaching economy and legislation related matters to craftsmen and SME representatives, as well as knowledge of the intersection between economy and sustainability related matters.

The training was developed by by: Vilniaus statybininkų rengimo centras in 2020 in the Project “Management and Technologies of Water, Wastewater, Waste and Circular Economy (WWW&wa)” and prepared for the 3LoE project by Wirtschaftsförderungsinstitut (WIFI) Steiermark. The lecturer acknowledged the quality of the provided curriculum, choosing to follow it closely and supplement the provided information with local practice examples.

### **“Fundamentals of the Circular Economy” curriculum (88 hours)**

	Topic	Contact hours	Individual study
1	Definition of the circular economy	10	6
2	Stages of the circular economy	36	20
3	Climate change	8	4
4	Waste management	12	8
5	Management of specific waste types	14	8
6	Management of hazardous waste	8	8
	Altogether	88	54

The training was completed with an individual written examination, taken in person.

### 5.3 Participants profile and organisation of the training

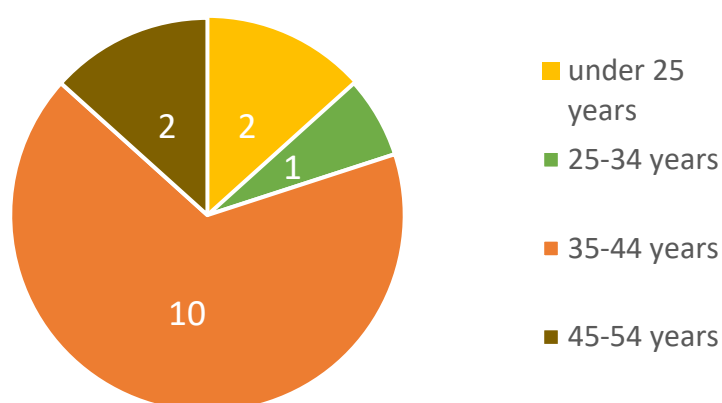
The training was held from September 7 to October 26, 2023.

The training was carried out in hybrid mode – in person and online.

All of the participants of the Fundamentals of the circular economy training were members of the Latvian Chamber of Crafts.

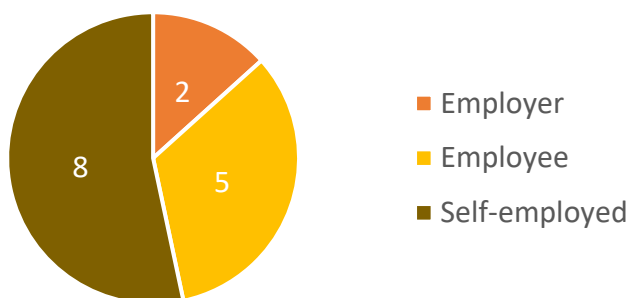
There were nine female participants and six male participants.

Age of participants:

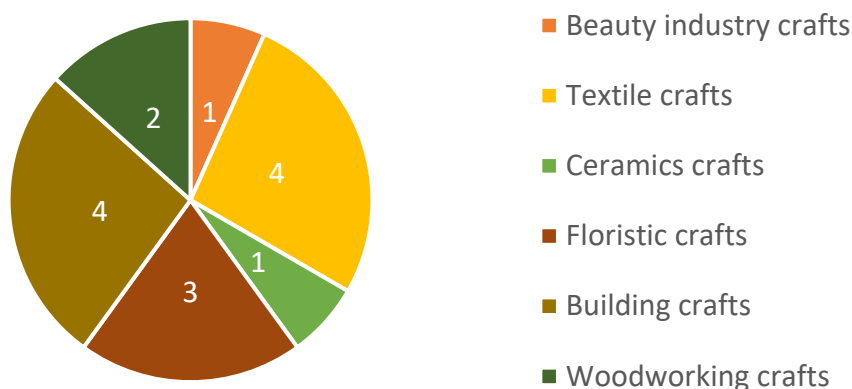


Most training participants were self-employed craftsmen, the rest either employers or employees of SMEs:





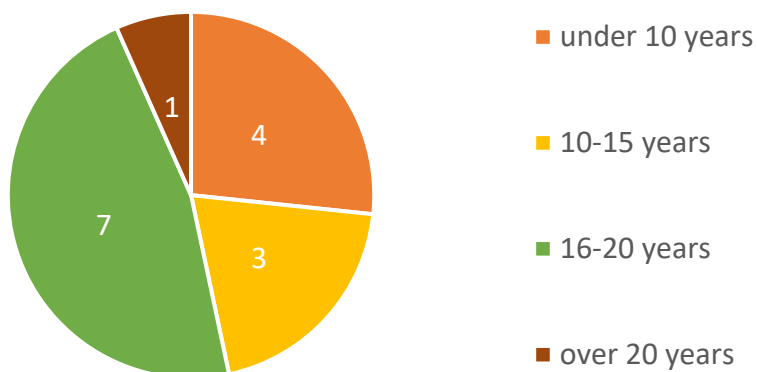
Following is the variety of crafts groups represented by the participants:



The represented crafts were:

- beauty industry crafts – hairdresser,
- textile crafts – tailor, textile manufacturer, embroiderer,
- ceramics crafts – ceramicist,
- floristic crafts – florist,
- building crafts group – painter, potter, carpenter,
- woodworking group – woodworker.

The work experience of the trainees ranged from 7 to 44 years:



## 5.4 Execution of the Training

### 1. Definition of the Circular Economy

In this module, participants established a foundational understanding of the circular economy. They examined key EU regulatory documents such as the Circular Economy Action Plan and the Circular Economy Package, gaining insights into policy guidelines and objectives. Local case studies were presented to showcase new business opportunities within a circular economy model, inspiring participants to envision practical applications for their own crafts and businesses.

### 2. Stages of the circular economy

This module provided participants with an in-depth, step-by-step exploration of the core stages of the circular economy. The module was designed to help participants understand how each phase in the lifecycle of a product—ranging from raw material extraction to end-of-life management—fits into a circular model. By the end, participants gained a holistic perspective on how each stage interconnects to minimize waste and maximize resource efficiency.

#### 2.1. Resources

The module began with an exploration of primary raw materials of different fields, taking into account the different fields of the trainees. It then transitioned to studying secondary raw materials, focusing on the processes that convert waste into secondary resources. Finally, participants learned to categorize secondary raw materials based on composition, acquiring in-depth knowledge of materials such as plastic, glass, paper, and metals, as well as their potential for reuse.

#### 2.2. Design

Participants were introduced to eco-design principles, learning strategies to select environmentally friendly materials and reduce resource consumption. Examples of eco-design in crafts practice allowed participants to discuss sustainable production management, logistics, and methods to extend product life. By the module's end, participants had explored real-world applications of eco-design and discussed best practices for integrating these principles into their own crafts.

#### 2.3. Production

In this module, participants examined effective and sustainable production technologies, gaining insights into innovations that reduce environmental impact. Additionally, they explored the purpose of eco-labels and the criteria for products to be eco-labeled, gaining a deeper understanding of how these labels help consumers make environmentally responsible choices.

#### 2.4. Distribution

Participants reviewed different packaging types and learned to classify them by purpose, material, and usage. They then studied various packaging labels, covering the symbols and regulations associated with different materials and their use in practice in Latvia.

#### 2.5. Re-use

The Zero Waste concept was introduced, emphasizing reduction and repurposing to minimize waste, as well as giving local practices of Zero Waste initiatives. Participants discussed examples from the sharing economy and analysed how such models could be adapted to their line of work. They also explored the potential for reusing materials such as plastic, glass, paper, metal, and wood, brainstorming ways to extend the lifecycle of these materials.

## **2.6. Waste Collection**

Participants delved into the principles of waste sorting, evaluating the pros and cons of different methods. They gained country-specific knowledge on the sorting and handling of materials such as glass, paper, and organic waste, re-familiarizing themselves with national waste sorting requirements.

## **2.7. Recycling**

In this module, participants compared various waste recycling technologies, studying examples of companies in the EU that excel in recycling. They weighed the advantages and challenges of recycling, gaining a practical understanding of how to incorporate new recycling practices into their own workflows.

## **3. Climate Change**

Participants examined the consequences of air pollution, including global warming, ozone depletion, and acid rain, with a particular focus on their impact in Europe. They then reviewed key international agreements, such as the UNFCCC, Kyoto Protocol, and Paris Climate Change Agreement, discussing personal and collective actions to mitigate climate change.

## **4. Waste Management**

This module covered the national regulations governing waste management, financial supports for environmental projects, and the principles of waste management hierarchy. Participants also learned about waste cataloging, quantification, storage, and the financial requirements necessary for compliance. This module equipped participants to understand and implement sustainable waste management practices in their businesses.

## **5. Management of Specific Waste Types**

Participants learned the regulatory requirements for managing various waste types, including household, biodegradable, packaging, construction, and bulky waste. They reviewed the guidelines for landfill waste disposal and explored the regulatory framework for setting up and managing landfills, which deepened their understanding of compliant waste disposal practices.

## **6. Management of Hazardous Waste**

Participants gained knowledge about hazardous waste identification, legal requirements for labeling, and the warning symbols for hazardous materials. They learned the proper handling techniques for electronic waste and the risks associated with improper disposal. By the end of this module, participants were prepared to handle hazardous materials safely and responsibly within their businesses.

## **7. The training was completed with an individual written examination, taken in person.**

### **5.5 Main Findings and Conclusions**

Throughout the Fundamentals of the Circular Economy training, members of Latvian Chamber of Crafts acquired foundational knowledge of circular economy principles, enhanced their understanding of sustainable material use, and gained practical insights into eco-design, production, and waste management strategies. The program revealed several key findings, including both the strengths of adopting circular practices in craftsmanship and some of the challenges craftsmen may face along this path.

The training successfully raised awareness within the trainees about the principles of the circular economy and its relevance to craftsmanship. Many participants recognized that circular practices, such as using secondary materials and optimizing resource use, could help reduce costs. This was especially evident in waste reduction and material efficiency modules, where participants discovered new ways to utilize reclaimed and recycled resources, which could potentially lower production costs and dependency on finite primary resources.

Participants expressed a greater understanding of EU policies and environmental standards, feeling more equipped to align their businesses with both national and international sustainability goals. This foundational knowledge set the stage for participants to confidently apply circular strategies in their trades.

The training highlighted the potential for circular practices to not only improve environmental outcomes but also create a competitive advantage. Some participants were enthusiastic about the potential for revenue streams within the circular economy, particularly through repair, refurbishment, and reuse models.

The training emphasized the importance of community engagement and locally sourced materials, resonating with participants' existing values. Participants reported that circular economy practices could strengthen local economies, increase collaborations, and reduce environmental impact through shortened supply chains and partnerships with local waste management services.

Many participants expressed concerns about the initial costs and time investment required to transition to circular practices. Implementing eco-design or sourcing recycled materials, for example, may require additional upfront resources, making it challenging for smaller enterprises or particular crafts fields such as beauty crafts. This challenge could be mitigated with further financial support or incentives. For craftsmen in rural areas, the availability of recycled materials and necessary infrastructure remains limited.

While participants gained a better understanding of relevant regulations, they also found that navigating the compliance requirements, especially for waste management and hazardous materials, can be complex.

Shifting to circular economy practices requires a mindset change, not only for craftsmen but also for consumers who may need to adjust to products designed for longevity and repairability rather than immediate disposal. Craftsmen acknowledged that further education and awareness-raising efforts are necessary to build consumer demand for sustainable products.

Overall, the 3LoE Fundamentals of the Circular Economy training provided a valuable foundation for the craftsmen of Latvian Chamber of Crafts to integrate sustainable practices into their work

Moving forward, additional support in terms of grants, access to recycling infrastructure, and consumer education will be essential to fully realize the potential of circular economy practices within the crafts sector. This training represents an important first step, positioning Latvian craftsmen as key contributors to a sustainable economy, protecting the environment while preserving and modernizing their valuable trades.

## Implementation Training Systemic solution-oriented consulting

### Latvijas Amatniecības kamera<sup>10</sup>

#### 1. Introduction

The "Systemic Solution-Oriented Consulting" training program developed by Bialystok Foundation of Professional Training in 2020 in the Project "Management and Technologies of Water, Waste Water, Waste and Circular Economy (WWW&CE)", prepared for the 3LoE project by the Wirtschaftsförderungsinstitut (WIFI) Steiermark and implemented by the Latvian Chamber of Crafts, is designed to equip participants with the essential knowledge and skills to become effective consultants, enabling them to implement sustainable and practical solutions that benefit both their businesses, clients and the broader community.

This training program aims to enhance the consulting capabilities of craft masters by providing them with the tools to identify, develop, and implement solutions that are specifically tailored to the unique needs of their clients. By focusing on sustainability, the program encourages participants to become advocates for eco-friendly practices, understanding the environmental impacts within their industry and learning how to integrate sustainable solutions into their daily operations.

One of the key objectives of this training is to strengthen the ability of participants to build and maintain strong client relationships. Effective communication and persuasion are essential skills for any consultant, and this program emphasizes the development of these skills to ensure that participants can clearly convey the value of sustainable practices to their clients. This not only enhances the likelihood of successful project outcomes but also fosters long-term relationships based on trust and mutual benefit.

The program also places a strong emphasis on the practical application of the skills learned. Participants are encouraged to apply their new consulting approaches directly within their professional contexts, allowing them to see the immediate benefits of their learning and to contribute to tangible improvements in their business operations. This focus on real-world impact ensures that the training is not only theoretical but also directly relevant to the everyday challenges faced by craft masters.

Participants begin with an introduction to the fundamentals of consulting, where they gain an understanding of the consultant's role in crafting effective solutions for environmental and economic challenges. This foundational knowledge is particularly relevant as many craft businesses are under pressure to adapt to new regulations and market demands related to environmental sustainability. By exploring the environmental issues that directly impact the crafts industry, such as resource management and waste reduction, participants learn how to develop strategies that not only meet these challenges but also create long-term value for their businesses.

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<sup>10</sup> Prepared by Latvian Chamber of Crafts



The training also emphasizes the step-by-step process of solution-oriented consulting. This approach is particularly valuable for craft masters, who often face complex problems that require tailored solutions rather than one-size-fits-all answers. The program teaches participants how to systematically identify problems, explore viable solutions specific to the client's field of work and location, and implement them effectively while maintaining objectivity and integrity. This structured approach is crucial for crafts professionals who must balance creative work with practical business considerations, ensuring that their solutions are both innovative and feasible.

Participants dive into advanced techniques essential for conducting effective market research, a crucial skill for any consultant aiming to offer informed and viable solutions. Craft masters learn how to perform desk research, which involves gathering and analysing relevant market data to identify reliable, sustainable solutions. This skill is vital in an industry where understanding market trends and the availability of eco-friendly materials and processes can significantly impact the success of a business.

Financial analysis and planning are also some of the key focuses. Participants are trained to conduct comprehensive financial assessments, including cost-benefit analyses, risk evaluations, and rate-of-return calculations. These skills enable craft masters to not only propose environmentally sound solutions but also to ensure these solutions are financially viable. Understanding and utilizing financial programs, grants, and other funding sources are also covered, providing participants with the tools to secure the necessary resources for implementing their consulting recommendations.

Effective report creation and presentation techniques form another critical aspect of this course. The participants learn how to structure and write consulting reports that clearly communicate their findings and recommendations, emphasizing the economic and environmental benefits of their proposed solutions. The training also covers the use of digital tools, such as tablets and smartphones, for real-time presentations, integrating multimedia and interactive elements to enhance client engagement. This ensures that participants can present their solutions convincingly and professionally, whether in-person or in virtual environments.

Overall, the content of this training is highly relevant to the target audience, providing them with the tools and knowledge needed to navigate the evolving demands of the crafts industry. It prepares them to take on consulting roles with confidence, equipping them to not only improve their own business practices but also to offer valuable guidance to others in their field. This makes the training a critical resource for craftsmen looking to elevate their professional capabilities and contribute to the sustainability and growth of their industry.

Through this training, the Chamber aims to significantly enhance the participants' professional value by acquiring consulting knowledge and competencies that will make them more competitive and versatile within the crafts industry both locally and internationally. Additionally, the promotion of sustainable business practices can lead to cost

savings, improved brand reputation, and a positive environmental impact, further adding to the long-term benefits of this training.

## 2. Admission and organisation of the training

Latvian Chamber of Crafts disseminated information about the chance to participate in the training by phone and e-mail.

The training was implemented by Latvian Chamber of Crafts' member Alvars Baldiņš, with whom the Chamber has had longstanding cooperation and also carries out pedagogical training within journeyman and master training.

The curriculum was developed by Bialystok Foundation of Professional Training in 2020 in the Project "Management and Technologies of Water, Wastewater, Waste and Circular Economy (WWW&CE)" and prepared for the 3LoE project by the Wirtschaftsförderungsinstitut (WIFI) Steiermark.

The training was attended by 15 participants. All the training participants were Latvian Chamber of Crafts members (self-employed persons or SME representatives – employees and employers).

The duration of the training was modified to fit the needs of the trainees and respectively held over a period of 6 weeks, three lectures per weekday evenings.

The curriculum of the training can be found below.

Time duration (in hours)	Topic
4	<b>Introduction to consulting</b> <b>Fundamentals of Environmental Consulting:</b> <ul style="list-style-type: none"> <li>• Overview of environmental issues relevant to craft SMEs and self-employed craftsmen. Environmental protection – Europe, Latvia, regional and household level.</li> <li>• Impact of the consumer's behavior on the environment.</li> <li>• Introduction to the role of environmental consultants and their impact on sustainability.</li> </ul>
4	<b>Steps and Principles of solution-oriented Consulting:</b> <ul style="list-style-type: none"> <li>• Detailed breakdown of the consulting process: identifying the problem, looking for solutions, implementing the solution and convincing the customer.</li> </ul>
8	<ul style="list-style-type: none"> <li>• Emphasis on objectivity, integrity, and long-term environmental benefits.</li> </ul> <b>Mind Mapping for Solution Development:</b>

8	<ul style="list-style-type: none"> <li>• Analysis of successful environmental initiatives led by craftsmen and SMEs. Lessons learned, best practices, and practical takeaways from real-life examples.</li> <li>• Techniques for creating and using mind maps to organize thoughts and strategies.</li> <li>• Practical exercises to develop and visualize comprehensive environmental solutions.</li> </ul> <p><b>Consumer Engagement and Persuasion:</b></p> <ul style="list-style-type: none"> <li>• Strategies for effectively communicating the value of environmental solutions to clients. Confidence building factors.</li> <li>• Objectivity conditions. Customer orientation methods.</li> <li>• Examples of comparing offers, products. Criteria for comparing pro-ecological solutions.</li> </ul>
5	<b>Self-study work at workplace</b>
8	<p><b>Universal Consulting Competencies</b></p> <p><b>Core Consulting Skills:</b></p> <ul style="list-style-type: none"> <li>• In-depth training on active listening, paraphrasing, non-verbal communication.</li> <li>• Presentation and knowledge transfer techniques to build trust and credibility with clients through empathy, clarity, and evidence-based arguments. Customer diversity.</li> </ul>
8	<p><b>Thematic Scenarios:</b></p> <ul style="list-style-type: none"> <li>• Consulting scenarios in key areas: water management, renewable energy sources (RES), wastewater treatment, waste management, and air quality.</li> <li>• Customization of scenarios to reflect the specific work environments and daily challenges of craftsmen.</li> </ul>
4	<p><b>Role-play Simulations:</b></p> <ul style="list-style-type: none"> <li>• Engaging role-play sessions simulating real-world consulting situations.</li> <li>• Recording and playback of these sessions for detailed analysis and feedback.</li> </ul>
4	<p><b>Feedback and Group Analysis:</b></p> <ul style="list-style-type: none"> <li>• Structured feedback sessions with peers and trainers to evaluate performance.</li> <li>• Group discussions to analyze recorded role plays, identifying strengths and areas for improvement.</li> </ul>
5	<b>Self-study work at workplace</b>
8	<p><b>Workshop techniques for a solution-oriented consultant</b></p> <p><b>Market Research Methodologies:</b></p> <ul style="list-style-type: none"> <li>• Techniques for conducting desk research to identify reliable solutions.</li> </ul>

8	<ul style="list-style-type: none"> <li>• Tips for evaluating and selecting the most viable solutions based on market data.</li> </ul>
4	<p><b>Financial Analysis and Planning:</b></p> <ul style="list-style-type: none"> <li>• Strategies for conducting comprehensive financial analysis, including cost-benefit account, risk assessments and rate of return. Market forecasts.</li> <li>• Training on identifying and utilizing financial programs, grants, and other funding sources.</li> </ul>
4	<p><b>Effective Report Creation:</b></p> <ul style="list-style-type: none"> <li>• Instruction on structuring and writing consulting reports that clearly communicate findings and recommendations.</li> <li>• Reporting benefits (rate of return, forecasts, social and environmental benefits), alternatives (solution comparison, contract and contact).</li> <li>• Emphasis on tailoring reports to client needs and ensuring clarity and professionalism.</li> </ul> <p><b>Report presentations:</b></p> <ul style="list-style-type: none"> <li>• Training on using tablets, smartphones, and Internet resources to present solutions in real-time environments.</li> <li>• Techniques for integrating multimedia and interactive elements into presentations to enhance client engagement.</li> <li>• Guidance on utilizing digital tools for remote consulting and virtual presentations.</li> </ul>
5	<b>Self-study work at workplace</b>
4	<p><b>Practical examination in the working environment</b></p> <p><b>Mandatory Case Study Execution:</b></p> <ul style="list-style-type: none"> <li>• Participants are required to conduct a case study within their work environment, applying the consulting skills and knowledge acquired in previous modules.</li> <li>• The case study focuses on real-world challenges, allowing participants to practice problem-solving, analysis, and solution implementation directly related to their professional context.</li> <li>• Case-study involves preparation of financial analysis, final report and presentation role-play with the examiner.</li> </ul>
	<b>Performance evaluation and issuing of certificate</b>

### 3. Participants profile and organisation of the training

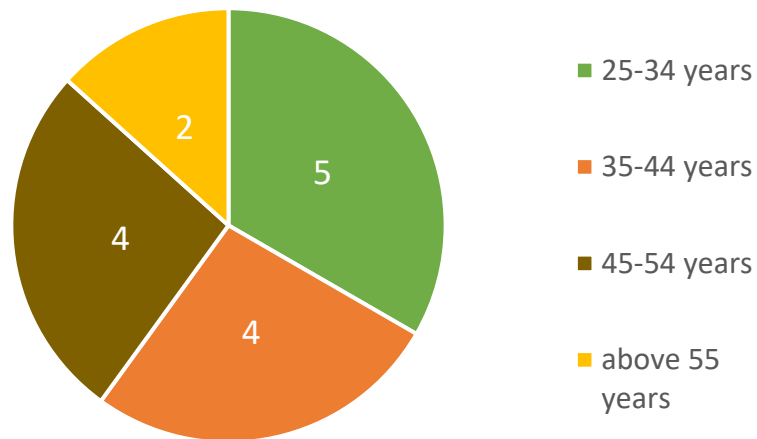
The training was held from 16 May, 2023 to 20 June, 2023.

The training was carried out in person.

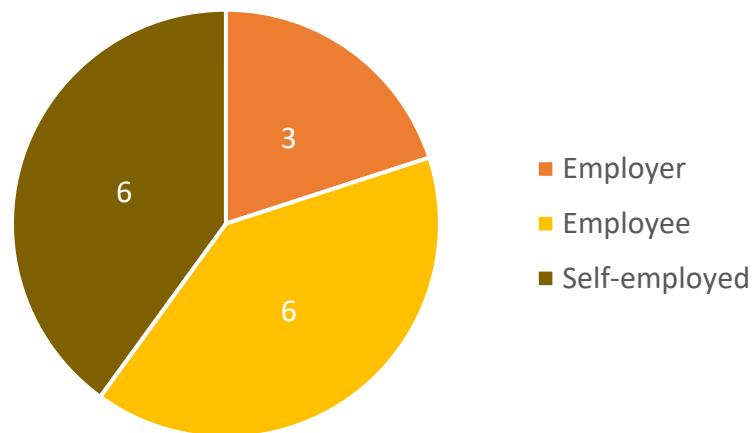
All of the participants of the Systemic solution-oriented consulting training were members of the Latvian Chamber of Crafts.

There were two female participants and thirteen male participants.

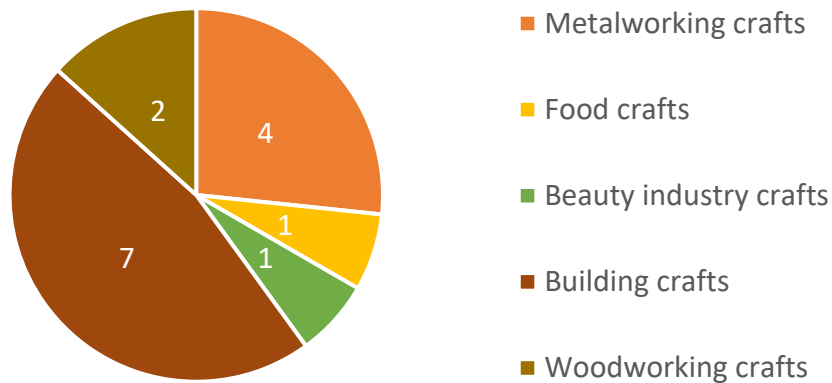
Age of participants:



Most training participants came from SMEs. Six participants were self-employed craftsmen:



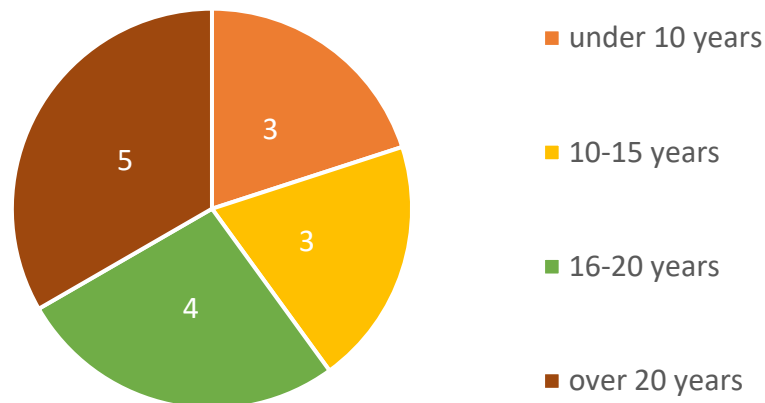
Following is the variety of crafts groups represented by the participants:



The represented crafts were:

- metalworking crafts – car painter, car mechanic, blacksmith,
- food crafts – cook,
- beauty industry crafts – hairdresser,
- building crafts group – stonemason, carpenter, potter, chimney sweeper,
- woodworking group – woodworker.

The work experience of the trainees ranged from 7 to 44 years:



#### 4. Execution of the Training

Following is an overview of the execution of each study module of the “Systemic solution-oriented consulting” training:

##### **Module: Introduction to Consulting**

##### **Fundamentals of Environmental Consulting (4 hours)**

In the "Fundamentals of Environmental Consulting" session, participants gained a comprehensive understanding of the environmental issues most relevant to their respective crafts, such as the environmental impact of material sourcing, waste management practices in workshops, and energy consumption during the production process. Over four hours, they explored the various levels of environmental protection



measures, from European and Latvian frameworks down to regional and household levels. The session effectively highlighted the significant impact of consumer behaviour on the environment, helping participants recognize how their decisions and those of their clients contribute to broader ecological outcomes. Through this training, participants were introduced to the critical role of environmental consultants, understanding how they can drive sustainable practices within their industry.

### **Steps and Principles of Solution-Oriented Consulting (4 hours)**

The "Steps and Principles of Solution-Oriented Consulting" session offered a detailed breakdown of the consulting process, which was well-received by the participants. This four-hour training session guided them through the essential steps of consulting, from problem identification to solution implementation and client persuasion. The craft masters appreciated the focus on finding objective, craft and location-specific solutions when advocating for sustainable consulting practices.

### **Mind Mapping for Solution Development (8 hours)**

During the "Mind Mapping for Solution Development" session, participants engaged in hands-on learning over eight hours, which significantly enhanced their problem-solving capabilities. They began by analyzing successful environmental initiatives from SMEs, drawing valuable lessons and practical insights from these real-world examples. The introduction of mind mapping techniques was a highlight, as participants learned to organize and visualize strategies effectively. Through practical group exercises taken from the curricula, they applied these techniques to real-life scenarios, allowing them to develop and present comprehensive environmental solutions. The session was particularly impactful, as it empowered the participants to think critically and creatively, fostering innovative approaches to the environmental challenges they encounter in their consulting work.

### **Consumer Engagement and Persuasion (8 hours)**

The "Consumer Engagement and Persuasion" part provided participants in-depth training on the art of effectively communicating the value of environmental solutions to clients. Through mind-mapping, the participants explored various strategies for maintaining objectivity and effectively orienting their consulting methods to meet client needs. This session equipped participants with the skills necessary to convincingly advocate for sustainable practices, ensuring that clients not only understood the environmental and economic benefits but were also persuaded to implement these solutions. The training significantly boosted participants' confidence in their ability to influence client decisions and promote sustainability within their industry.

## **Self-Study Work at the Workplace**

Following the formal training sessions, participants engaged in self-study work at their workplaces. The trainees used mind-mapping and research to come up with solutions for provided consulting scenarios, which they later presented to their colleagues, allowing them to apply the concepts and skills they had learned in real-world settings.

## **Module: Universal Consulting Competencies**

### **Core Consulting Skills (8 hours)**

The training on "Core Consulting Skills" was a pivotal part of this module, conducted over eight hours. Participants delved deep into the nuances of effective communication, with a strong focus on active listening, paraphrasing, and non-verbal communication. These elements were crucial for enhancing their ability to understand clients' needs and respond appropriately. The session also covered presentation and knowledge transfer techniques designed to build trust and credibility with clients. By emphasizing empathy, clarity, and evidence-based arguments, the training ensured that participants could communicate effectively across a diverse customer base. This segment was particularly valuable in helping participants navigate the complexities of customer diversity within the crafts sector, equipping them with the tools to engage meaningfully with a broad range of clients.

### **Thematic Scenarios (8 hours)**

In the "Thematic Scenarios" session, participants spent eight hours exploring consulting scenarios across key environmental areas, including water management, renewable energy sources (RES), wastewater treatment, waste management, and air quality. These scenarios were tailored to reflect the specific work environments, participant craft groups (metalworking, woodworking, building, beauty and food groups) and daily challenges faced by craftsmen. Participants were able to apply the core consulting skills they had learned in the previous session to these scenarios, allowing them to practice problem-solving in contexts directly relevant to their work. This customization made the training highly applicable, ensuring that participants could immediately relate to and implement the strategies discussed. By working through these scenarios, participants gained a deeper understanding of how to approach complex environmental issues within their own professional settings.

### **Role-play Simulations (4 hours)**

The "Role-play Simulations" provided participants with four hours of immersive, practical experience. These sessions allowed them to simulate real-world consulting situations, putting their newly acquired skills to the test in a controlled environment. The role-plays were recorded, enabling participants to review and analyze their performances critically. This approach was instrumental in helping them identify areas of

strength as well as aspects needing improvement. The hands-on nature of these simulations was particularly effective in building confidence and refining participants' consulting techniques, as they could directly experience and learn from the challenges of real-life consulting scenarios, as well as receive immediate feedback in the next session.

### **Feedback and Group Analysis (4 hours)**

Following the role-play sessions, participants engaged in four hours of "Feedback and Group Analysis." These structured feedback sessions, involving both peers and trainers, were designed to provide detailed evaluations of each participant's performance. The group discussions that followed were crucial in fostering a collaborative learning environment, where participants could share insights, learn from one another's experiences, and collectively identify best practices. This segment of the training was effective in reinforcing the lessons learned during the role-play simulations, as it provided an opportunity for participants to reflect on their experiences and gain constructive feedback that could be applied in future consulting engagements.

### **Self-study Work at the Workplace (5 hours)**

The module concluded with five hours of self-study work at the participants' workplaces. This self-directed learning component once again allowed them to apply the skills and knowledge they had acquired during the training to their real-world professional contexts. The trainees tried out the learnt consulting techniques with their colleagues, advising them on possible improvements in their current day-to-day work. Some of the trainees even managed to implement the learnt information in their work with clients – for example, providing suggestions about different environmentally-friendly material sourcing in the building sector.

## **Module: Workshop Techniques for a Solution-Oriented Consultant**

### **Market Research Methodologies (4 hours)**

The "Market Research Methodologies" sessions, lasting eight hours altogether, consisted of a deeper dive into the tools and techniques necessary for conducting thorough desk research. Participants learned how to identify and evaluate reliable solutions based on comprehensive market data. This training was particularly beneficial in helping them discern the most viable solutions for their clients, considering factors such as market trends, consumer behavior, and technological advancements. The session emphasized practical approaches to gathering and analyzing data, which are crucial for making informed decisions in consulting. The goal of the sessions was for the participants to be proficient in conducting market research that could support sustainable and innovative solutions tailored to the needs of different crafts sectors.

### **Financial Analysis and Planning (8 hours)**

In the "Financial Analysis and Planning" session, participants engaged in eight hours of training focusing on strategies for conducting detailed financial analyses. They were introduced to key concepts such as cost-benefit accounting, risk assessments, and calculating rates of return. The session also covered market forecasts, providing participants with the tools to anticipate financial outcomes and make data-driven recommendations. Additionally, the training included guidance on identifying and utilizing local and EU level financial programs, grants, and other funding sources. This aspect of the module was particularly valuable for participants looking to support both their clients, and their own enterprises in securing funding for sustainable projects. By the end of this session, participants understanding of financial planning, enabling them to offer well-rounded consulting services that consider both environmental impact and economic viability.

### **Effective Report Creation (8 hours)**

The "Effective Report Creation" session provided participants with four hours of focused training on structuring and writing consulting reports. The instruction covered the essential elements of a high-quality report, including clear communication of findings and recommendations, as well as how to report benefits such as rates of return, forecasts, and social and environmental impacts. Participants also learned how to present alternatives, compare solutions, and provide clear contracts and contact information. This session emphasized the importance of tailoring reports to meet client needs, ensuring clarity, professionalism, and actionable insights. Through this session participants were equipped to produce consulting reports that not only informed but also persuaded and guided their clients towards the best possible solutions.

### **Report Presentations (4 hours)**

In the final segment of the module, participants spent four hours honing their presentation skills. This training focused on using digital tools such as tablets, smartphones, and internet resources to present solutions in real-time environments. Participants were introduced to techniques for integrating multimedia and interactive elements into their presentations, enhancing client engagement and understanding. The session also provided guidance on utilizing digital tools for remote consulting and virtual presentations. The trainees spoke highly both of this session and the module altogether, mentioning that the provided techniques will be useful not only for consulting, but their day-to-day work with colleagues and clients.

### **Self-Study Work at the Workplace (5 hours)**

Following the formal training sessions, participants once again undertook self-study work at their respective workplaces. The trainees began preparing for their final examination by choosing an example case from the work performed for previous clients and

carrying out market research and financial analysis to come up with a more environmentally friendly solution for the given case.

### **Practical examination in the working environment (4 hours)**

Taking the previously prepared market research and financial analysis, the participants created a report as previously practiced. The report was then presented to the examiner using the chosen technology (laptop or tablet) and learnt platform (Prezi, Genially, Mural or other). The role-play presentation allowed participants to simulate a consulting scenario, where they presented their solution to the examiner as if they were presenting it to a client. This exercise tested their ability to communicate effectively, engage their audience, and defend their recommendations with evidence-based arguments.

## **5. Main Findings and Conclusions**

Through the comprehensive “Systemic solution-oriented consulting” training, participants gained critical skills and knowledge necessary for integrating effective consulting practices into their craft-related businesses. The program covered a range of essential topics, from environmental issues to financial analysis and market research, providing a solid foundation for participants to enhance their professional practices.

One of the most notable outcomes of the training was the enhanced understanding of environmental issues specific to the crafts industry. Participants developed a deeper awareness of how environmental challenges, such as waste management, energy efficiency, and the sustainable sourcing of materials, directly impact their businesses and the broader market. This newfound knowledge empowered them to make more informed decisions that align with both environmental sustainability and consumer expectations.

The training also proved effective in developing core consulting competencies among participants. Many craftsmen, who initially had limited experience in consulting, reported significant improvements in their communication skills. The role-play simulations and subsequent feedback sessions were frequently highlighted as a major strength of the program, as they provided a practical and interactive learning experience. Some participants noted that the role-play exercises could have been even more effective with additional time for practice and more diverse scenarios.

In terms of financial analysis, the program succeeded in equipping participants with the ability to perform detailed cost-benefit analyses, risk assessments, and market forecasts. These skills are crucial for the economic sustainability of craft businesses and their clients, enabling participants to make data-driven decisions that can enhance profitability. Many of the participants appreciated the in-depth look at concepts such as cost-benefit analysis and calculating rates of return in the specific context of environmental solutions.

The incorporation of market research methodologies into the training was another positive aspect, as participants learned how to conduct thorough research to identify viable solutions for their clients. This focus on data-driven decision-making was interesting to many craftsmen, however, some participants expressed that applying these research techniques in their specific contexts could be difficult as there was not enough data



concerning environmental solutions in their specific field of craft – at least not local data.

In terms of report creation, the training emphasized the importance of structuring consulting reports in a manner that is both logical and easy to follow. The instruction focused on ensuring that reports not only convey the necessary information but do so in a way that is tailored to the client's needs and level of understanding. The emphasis on clarity and professionalism in report writing was particularly important, as many craftsmen are more accustomed to hands-on work than to formal documentation. By the end of the training, participants reported feeling more confident in their ability to produce reports that effectively communicate their expertise and recommendations.

Presentation skills were another key focus of this training, recognizing that even the best-crafted report can fall flat without an engaging presentation to bring it to life. The training provided participants with techniques for presenting their solutions using digital tools. Participants learned how to integrate multimedia elements into their presentations—such as charts, videos, and interactive components—to enhance client engagement and make their presentations more dynamic. This was particularly beneficial for those who have not had much experience presenting complex information in a visual way.

The practical examination, which involved conducting a mandatory case study, was a critical component of the training. This exercise allowed participants to apply their newly acquired skills to real-world challenges in their work environments. Most participants appreciated the hands-on research and analysis, noting that it helped solidify their understanding and ability to implement solutions, as well as introduce the new concepts to their colleagues in the process.

In conclusion, the "Systemic Solution-Oriented Consulting" training has successfully provided participants with the tools and knowledge to address both environmental and connected economic challenges with their clients. While the training was well-received overall, with participants praising its practical approach and relevance, some suggestions for improvement included extending certain sessions for deeper understanding and providing more tailored support for applying concepts in specific craft contexts.

The success of this training underscores the importance of continuous professional development in the crafts industry, particularly in areas that promote sustainability and economic resilience. As a result, the Latvian Chamber of Crafts has established a strong foundation for further learning, and it is possible that parts of the course could be implemented in the standard master training.



## Training Customer service fitter modules Chamber of Crafts Dresden<sup>11</sup>

Additional qualifications are training programmes offered by training providers and companies for in-company trainees. The content includes practical skills and abilities in the field of modern processes and technologies and other industry-specific competences that are not included in the training regulations or curricula. This job-specific content is coupled with the acquisition of IT skills and knowledge of environmental protection and resource conservation. This increase in participants' skills is intended to improve their chances on the labour market when transitioning to work.

The aim of this additional qualification for customer service technicians for water-bearing fittings is to provide participants with the relevant skills and knowledge in order to gain an advantage and extended employment in the customer service sector.

Period of realisation:

The weekly seminar took place full-time from 2 to 6 September 2024 from 7:00 a.m. to 3:30 p.m., the scope of the course is 40 teaching units of 45 minutes each.

Methodology:

Training takes place in modern workshops with training walls for practical training. And on precision machine tools and in technically perfect workplaces.

Exercises are used to consolidate the teaching content and identify deficits, which are then compensated for through repetition and individual learning tasks.

All of the methods used are aimed at strengthening the trainees' personal resources and promoting awareness of job-related requirements. The focus here is on practical activities in order to acquire comprehensive competences.

In addition, key methodological and instrumental competences are deepened and social skills are consolidated.

The content is taught in a varied, subject-orientated and interactive way.

Content of the seminar:

In this course, after reviewing the basics, participants are taught advanced skills such as the maintenance of water-bearing fittings, water analysis, qualified customer discussions, service and repair of pre-wall elements, advanced expertise in water filter systems, service and repair in wastewater technology. The additional qualification is intended to improve the young people's professional skills and their chances on the labour market.

The training is carried out in compliance with the applicable accident prevention regulations.

Special features of the realisation:

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<sup>11</sup> Prepared by Rosemarie Weiser, Handwerkskammer Dresden, Germany

The additional qualification takes place in addition to the planned training. This means that the trainee should not have any vocational school attendance or inter-company training instruction in the training plan for this Period.

Approval and organisation of the training

Selection of participants/target group:

The target group are trainees in their 3rd and 4th year of training as plant mechanics for sanitary, heating and air conditioning technology with previous knowledge from the compulsory courses. The trainees have their place of work in the Free State of Saxony. The additional qualification can be completed by women and men.

Participants are recruited by announcing the planned programme to the relevant training companies. The trainer then decides together with the trainee whether to take part in the course and then registers the trainee at the training centre using the form provided.

The costs of the training are usually borne by the company, as the possible transfer of new tasks or the more efficient performance of current tasks creates corresponding added value for the company.

Participants receive comprehensive support at the Dresden Chamber of Crafts training centre. Customer support is the point of contact before the start of the course, e.g. with regard to costs, time frame, general conditions and admission requirements. After registration, the participants are selected and the participation of the respective trainees in the training company is confirmed by means of an agreement. At the start of the course, the respective trainer takes over the supervision of the participants. At the beginning of the course, the trainer provides extensive information on the general conditions in the company and the course schedule. A welcome, information on break times, house rules and instructions are provided at the start of the course. The instructor will also answer any questions that arise at the beginning or during the course.

Information about lecturers:

The assigned trainer is a permanent employee of the training centre and has a valid training authorisation through his master craftsman's certificate. In addition to his professional qualifications, he has many years of experience in initial and further training and uses the four-step method to impart knowledge. This active teaching method helps trainees to apply what they have learnt independently.

Participant profile and organisation of the training

Nine male trainees in the plant mechanics for sanitary, heating and air conditioning technology occupational group took part in the additional qualification. All of the trainees were in their 3rd or 4th year of training and therefore had the required prior knowledge. The training companies are all located in the Free State of Saxony.

Realisation of the training

The course was conducted in accordance with the following syllabus. The syllabus for the additional qualification of customer service technician for water-bearing fittings has the following content structure:

1. introduction and instruction on house rules, workshop regulations and occupational health and safety.
2. repetition of theoretical basics
3. exercises:
  - Replacing and repairing insert cartridges
  - Repairing surface-mounted and concealed taps when installed
  - Replacing upper valve parts for concealed taps/valves
  - Cleaning, repair, service and maintenance of water filters
  - Repair, service and maintenance of system separators and filling fittings
  - Water analysis system
4. troubleshooting for defective flushing systems:
  - on concealed pre-wall elements
  - Repair of faults incl. recommissioning and handover to customer
  - Replacement and repair of concealed urinal / cistern
5. customer service behaviour:
  - Talking to customers
  - Cleanliness and prudence in customer service work
  - First impression with the customer, behaviour with difficult customers
6. sewage accident:
  - Determining the cause
  - Procedure
  - Camera inspection in sewage pipe
  - Function and handling of backflow flap
7. repetition and evaluation
8. dismantling and tidying up
9. conclusion and open questions
10. summarising the most important findings of the course

The curriculum aims to enable participants to apply this learning content efficiently and responsibly in their day-to-day work.

No examination was taken. Participants received a personalised certificate of attendance at the end of the seminar (a sample is attached to the report)

The feedback from the participants on the questionnaires was predominantly very positive. The participants were particularly positive about the practical exercises and the opportunity to try things out for themselves.

### Main results and conclusions

#### Benefit:

By acquiring the additional skills and knowledge, the participant qualifies for the fastest possible deployment in the customer service area of his company. This creates the basis for the company to have another well-qualified employee in the customer service area for whom a sense of responsibility for the medium (foodstuff) water has top priority. This safeguards the company's efficiency. In detail, this also means securing the graduate's job. A strong craft industry is a decisive economic factor for the development of the region, which must be promoted.

The strengths of the training include the selected and applied highly practice-orientated mix of methods consisting of trainer input, instruction and subsequent implementation by the participants using examples relevant to their work. The number of participants was deliberately limited to a maximum of 12 in order to guarantee the individualised nature of the support provided by the trainer.

#### Conclusion:

The 'Additional qualification - customer service technician for water-bearing fittings' course is a valuable further training programme for trainees in the heating, plumbing and air conditioning technology profession who are interested in understanding and applying the latest technologies. With a strong focus on practical applications and a comprehensive curriculum, it provides participants with the tools they need to be successful and effective in an increasingly digitalised world of work in this field.

The training will be continued on the basis of the successfully tested seminar programme with the same partner and the named target groups. In terms of content, the fast-moving nature of the topic must be taken into account when continuing the programme and appropriate adjustments to the curriculum must be made on an ongoing basis by those involved in administration.

## Evaluation Concept<sup>12</sup>

### 1. Objectives and Methods of Evaluation

The following evaluation concept includes the "additional qualification" courses:

- Technologies water supply
- Technologies water saving
- Greywater and rainwater utilization technologies
- Technologies decentralized wastewater treatment
- Fundamentals of the circular economy
- Systemic solution-oriented consulting

#### 1.1 The Aim of the Evaluation

The general aim of the study is to evaluate the effectiveness of courses realized within the Project project „Three-level Centers of Professional Excellence: Qualification, Entrepreneurship and Innovation in the Green Economy“. The following purposes of evaluating courses are defined:

- To determine whether the objectives of the courses were achieved.
- To see how the knowledge and skills learned in the courses are put into practice.
- To assess the results of the courses.
- To assess the effectiveness of the courses.
- To assess whether the courses were properly implemented.
- To identify the strengths and weaknesses of the courses.
- To assess whether the courses were suitable in terms of the training contents, timing, participants and other aspects.
- To find problems of the courses and solutions for improvement.

The conclusions of the evaluation research will contribute to improve the quality and especially the effectiveness of courses, show the limitations of the courses models and indicate the direction for further activities.

#### 1.2 The Methods of the Evaluation

**Summative** and **Formative Evaluation** are used for courses evaluation. A **formative evaluation** (sometimes referred to as internal) is a method for judging the worth of a course while the course activities are forming (in progress). This part of the evaluation focuses on the process. Thus, formative evaluations are basically done on the fly. A **summative evaluation** (sometimes referred to as external) is a method of judging the worth of a course at the end of the course activities (summation). The focus is on the outcome.

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<sup>12</sup> Prepared by Panevezys University of Applied Sciences

### 1.3 Evaluation Tools

Evaluation tools are selected depending on the purposes and methods of evaluation (Table 1). Survey is one of the ways to provide feedback. For the **Formative Evaluation** surveys are used:

- Online survey of students using an identical questionnaire (Section 2).
- Online survey of the teachers using an identical questionnaire (Section 3).

For the **Summative Evaluation** Results implementation report of partner is used. This report provides course's statistics, for example number of participants, dropouts of students, student's exam results, etc.

Table 1. **Evaluation Tools According Methods of Evaluation**

<b>A formative evaluation</b>	Online survey of students using an identical questionnaire (Section 2). Online survey of the teachers using an identical questionnaire (Section 3).
<b>A summative evaluation</b>	Implementation report of partner

### 1.4 Data collection

Online surveys for participants and teachers will be carried in the last week of the training.

## 2. Survey of Students

The objective of the survey is to evaluate the course. The questionnaire is part of the project „Three-level Centers of Professional Excellence: Qualification, Entrepreneurship and Innovation in the Green Economy“. We would appreciate you taking a few minutes of your time to complete this evaluation form. Your comments and suggestions will help us to improve the course for development and implementations of additional qualifications.

#### 1. Choose the course you will evaluate:

- ☐ Technologies water supply
- ☐ Technologies water saving
- ☐ Greywater and rainwater utilization technologies
- ☐ Technologies decentralized wastewater treatment
- ☐ Fundamentals of the circular economy
- ☐ Systemic solution-oriented consulting



**2. Provide the name of the school/institution:**

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	<b><i>Background information</i></b>
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**3. Please indicate your gender:**

☐ Woman ☐ Man ☐ Prefer not to answer

**4. Please indicate your age:**

☐ Under 20 ☐ 20–29 ☐ 30–39 ☐ 40–49 ☐ 50–59 ☐ 60+

	<b><i>Evaluation of course content and teaching quality</i></b>
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**5. I have attended at least 2/3 lectures of the course**

☐ Strongly agree ☐ Agree ☐ Neither agree nor disagree ☐ Disagree ☐ Strongly disagree

**6. Lecturer encouraged my participation, initiative and interaction during the lectures**

☐ Strongly agree ☐ Agree ☐ Neither agree nor disagree ☐ Disagree ☐ Strongly disagree

**7. The objectives of the course and study results, evaluation criteria were clearly defined from the very beginning of the course**

☐ Strongly agree ☐ Agree ☐ Neither agree nor disagree ☐ Disagree ☐ Strongly disagree

**8. Assessment of the study results was appropriate**

☐ Strongly agree ☐ Agree ☐ Neither agree nor disagree ☐ Disagree ☐ Strongly disagree

**9. The content was interesting, relevant, useful and allowed to achieve study results**

☐ Strongly agree ☐ Agree ☐ Neither agree nor disagree ☐ Disagree ☐ Strongly disagree

**10. The course content responds to the latest scientific achievements**

☐ Strongly agree ☐ Agree ☐ Neither agree nor disagree ☐ Disagree ☐ Strongly disagree

**11. Theory was taught in conjunction with the practical examples**

☐ Strongly agree   ☐ Agree   ☐ Neither agree nor disagree   ☐ Disagree   ☐ Strongly disagree

**12. Theory was taught in context of the sustainable development issues**

☐ Strongly agree   ☐ Agree   ☐ Neither agree nor disagree   ☐ Disagree   ☐ Strongly disagree

**13. The course topics were not repetitive**

☐ Strongly agree   ☐ Agree   ☐ Neither agree nor disagree   ☐ Disagree   ☐ Strongly disagree

**14. The teaching materials were presented in an organized manner**

☐ Strongly agree   ☐ Agree   ☐ Neither agree nor disagree   ☐ Disagree   ☐ Strongly disagree

**15. The teaching materials distributed were helpful to achieve study results**

☐ Strongly agree   ☐ Agree   ☐ Neither agree nor disagree   ☐ Disagree   ☐ Strongly disagree

**16. The study methods chosen by the lecturer helped to understand the course**

☐ Strongly agree   ☐ Agree   ☐ Neither agree nor disagree   ☐ Disagree   ☐ Strongly disagree

**17. The teaching process included interactive methods**

☐ Strongly agree   ☐ Agree   ☐ Neither agree nor disagree   ☐ Disagree   ☐ Strongly disagree

**18. The lecturer was a good communicator**

☐ Strongly agree   ☐ Agree   ☐ Neither agree nor disagree   ☐ Disagree   ☐ Strongly disagree

	<i>Comments on strengths and ways of improvement</i>
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**19. How do you evaluate the course quality**

☐ Very satisfied   ☐ Satisfied   ☐ Neither satisfied nor dissatisfied   ☐ Dissatisfied   ☐ Very dissatisfied

**20. How do you evaluate the course lecturer**

☐ Very satisfied   ☐ Satisfied   ☐ Neither satisfied nor dissatisfied   ☐ Dissatisfied   ☐ Very dissatisfied

**21. Could you name the main advantages of this course?**

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**22. Which specific difficulties you encountered while studying the course?**

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**23. Could you name the main disadvantages of this course?**

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**24. What changes would you recommend to improve this course?**

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**Thank you for your answers!**

Electronic version of the survey available at <https://forms.gle/LRbGeYi12dySA3kV8>

### 3. Survey of Teachers

The objective of the survey is to evaluate the course. The questionnaire is part of the project „Three-level Centers of Professional Excellence: Qualification, Entrepreneurship and Innovation in the Green Economy“. We would appreciate you taking a few minutes of your time to complete this evaluation form. Your comments and suggestions will help us to improve the course for development and implementations of additional qualifications.

**1. Choose the course you will evaluate:**

- ☐ Technologies water supply
- ☐ Technologies water saving
- ☐ Greywater and rainwater utilization technologies
- ☐ Technologies decentralized wastewater treatment
- ☐ Fundamentals of the circular economy
- ☐ Systemic solution-oriented consulting

**2. Provide the name of the school/institution:**

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	<b>Background information</b>
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**3. Please indicate your gender:**

- ☐ Woman ☐ Man ☐ Prefer not to answer

**4. Please indicate your age:**

- ☐ Under 25 ☐ 25-29 ☐ 30-39 ☐ 40-49 ☐ 50-59 ☐ 60+

**5. Please indicate how long have you worked as a teacher:**

- ☐ This is my first year ☐ 1–2 years ☐ 3–5 years ☐ 6–10 years ☐ 11–15 years ☐ 16–20 years ☐ More than 20 years

**6. What is your employment status as a teacher:**

- ☐ Permanent employment ☐ Fixed term contract for a period of more than 1 academic-year ☐ Fixed term contract for a period of 1 academic-year or less

**7. What is the highest level of education you have completed:**

- ☐ Bachelor's degree or equivalent qualification ☐ Master's degree or equivalent qualification ☐ Doctor's degree or equivalent qualification ☐ Other

	<b>Evaluation of course structure and description</b>
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**8. Do you agree that the course aims are clear and well defined?**

- ☐ Strongly agree ☐ Agree ☐ Neither agree nor disagree ☐ Disagree ☐ Strongly disagree

**9. Do you agree that the competencies clearly describe knowledge and skills of student graduating from this course?**

- ☐ Strongly agree ☐ Agree ☐ Neither agree nor disagree ☐ Disagree ☐ Strongly disagree

**10. Do you agree that the learning outcomes correspond to the competencies?**

- ☐ Strongly agree ☐ Agree ☐ Neither agree nor disagree ☐ Disagree ☐ Strongly disagree

**11. Do you agree that the division of course hours into contact and self-learning hours is appropriate?**

☐ Strongly agree    ☐ Agree    ☐ Neither agree nor disagree    ☐ Disagree    ☐ Strongly disagree

**12. Do you agree that prerequisites to enter (minimum education required) is clear and well defined?**

☐ Strongly agree    ☐ Agree    ☐ Neither agree nor disagree    ☐ Disagree    ☐ Strongly disagree

	<i>Evaluation of course content</i>
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**13. Do you agree that the course content corresponds to the learning outcomes?**

☐ Strongly agree    ☐ Agree    ☐ Neither agree nor disagree    ☐ Disagree    ☐ Strongly disagree

**14. Do you agree that the course content is consistent?**

☐ Strongly agree    ☐ Agree    ☐ Neither agree nor disagree    ☐ Disagree    ☐ Strongly disagree

**15. Do you agree that the course topics are not repetitive?**

☐ Strongly agree    ☐ Agree    ☐ Neither agree nor disagree    ☐ Disagree    ☐ Strongly disagree

**16. Do you agree that the course content is modern?**

☐ Strongly agree    ☐ Agree    ☐ Neither agree nor disagree    ☐ Disagree    ☐ Strongly disagree

**17. Do you agree that the learning methods are appropriate to achieve the intended competences?**

☐ Strongly agree    ☐ Agree    ☐ Neither agree nor disagree    ☐ Disagree    ☐ Strongly disagree

**18. Do you agree that the assessment of competence is appropriate?**

☐ Strongly agree    ☐ Agree    ☐ Neither agree nor disagree    ☐ Disagree    ☐ Strongly disagree

	<i>Comments on strengths and ways of improvement</i>
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**19. Could you name the main advantages of this course?**

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**20. Could you name the main disadvantages of this course?**



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**21. What changes would you recommend to improve this course?**

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.....

**Thank you for your answers!**

Electronic version of the survey available at <https://forms.gle/srHZJ1ji7GyJShMm8>



## Evaluation Reports

### 1. Fundamentals of Circle Economy<sup>13</sup>

#### 1.1 The Course Implementation Statistics

##### 1. Number of students register in the course:

Autumn semester (*11 students*)

##### 2. Number of students according to gender:

Autumn semester (*8 Man, 3 Woman*)

##### 3. Number of students according to age:

Age group	Autumn semester:	
	Number	Percentage
Under 20	1	9,1
20-29	5	36,4
30-39	4	45,5
40-49	1	9,1
50-59	0	0,0
60+	0	0,0

##### 4. Number of students remaining at the completion of the course:

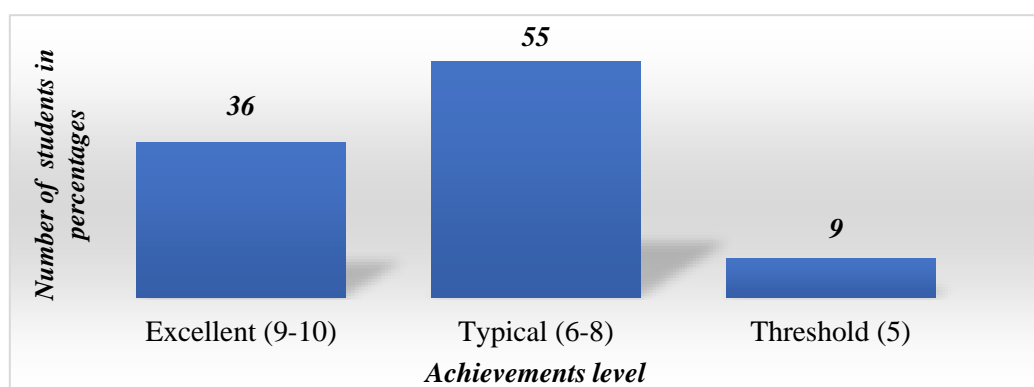
Autumn semester (*11 students*)

##### 5. Number of students withdrawn:

Autumn semester (-)

##### 6. Grade Distribution:

Achievements levels	Number	Percentage
Excellent (9-10)	4	36
Typical (6-8)	6	55
Threshold (5)	1	9



<sup>13</sup> Prepared by Panevėžio kolegija/University of Applied Sciences

## 1.2 The Course Evaluation by Students

### 1. Number of respondents (students):

151 students took part in the survey (PANKO – 11, VESK – 24, ESEV – 17, ZSMIL SLUPSK – 64, PPAR – 35)

### 2. Number of respondents according to gender:

16 Man, 135 Woman

### 3. Number of respondents according to age:

Age group	Percentage
Under 20	9,1
20-29	36,4
30-39	45,5
40-49	9,1
50-59	0,0
60+	0,0

Course evaluation by students was performed using online survey. Electronic version of the survey available at <https://forms.gle/LRbGeYi12dySA3kV8>. Online survey was carried in the last week of the training. 11 students took part in the survey, i. e. 100 percent of students who successfully completed the course.

## 7. Evaluation of course content and teaching quality

### 7.1. The objectives of the course and study results, evaluation criteria were clearly defined from the very beginning of the course:

	Number	Percentage
Strongly agree	6	55
Agree	5	45
Neither agree nor disagree	0	0,0
Disagree	0	0,0
Strongly disagree	0	0,0

### 7.2. Assessment of the study results was appropriate:

	Number	Percentage
Strongly agree	7	64
Agree	3	27
Neither agree nor disagree	1	9
Disagree	0	0,0
Strongly disagree	0	0,0

### 7.3. The content was interesting, relevant, useful and allowed to achieve study results:

	Number	Percentage
Strongly agree	7	64
Agree	4	36
Neither agree nor disagree	0	0,0
Disagree	0	0,0
Strongly disagree	0	0,0

### 7.4. The course content responds to the latest scientific achievements:

	Number	Percentage
Strongly agree	8	73
Agree	3	27
Neither agree nor disagree	0	0,0
Disagree	0	0,0
Strongly disagree	0	0,0

**7.5. Theory was taught in conjunction with the practical examples:**

	Number	Percentage
Strongly agree	6	55
Agree	4	36
Neither agree nor disagree	1	9
Disagree	0	0,0
Strongly disagree	0	0,0

**7.6. Theory was taught in context of the sustainable development issues:**

	Number	Percentage
Strongly agree	2	18
Agree	9	82
Neither agree nor disagree	0	0,0
Disagree	0	0,0
Strongly disagree	0	0,0

**7.7. The course topics were not repetitive:**

	Number	Percentage
Strongly agree	4	36
Agree	6	55
Neither agree nor disagree	1	9
Disagree	0	0,0
Strongly disagree	0	0,0

**7.8. The teaching materials were presented in an organized manner:**

	Number	Percentage
Strongly agree	5	45
Agree	6	55
Neither agree nor disagree	0	0,0
Disagree	0	0,0
Strongly disagree	0	0,0

**7.9. The teaching materials distributed were helpful to achieve study results:**

	Number	Percentage
Strongly agree	2	18
Agree	8	73
Neither agree nor disagree	1	9
Disagree	0	0,0
Strongly disagree	0	0,0

**7.10. Lecturer encouraged my participation, initiative and interaction during the lectures:**

	Number	Percentage
Strongly agree	8	73
Agree	3	27
Neither agree nor disagree	0	0,0

Disagree	0	0,0
Strongly disagree	0	0,0

**7.11. The study methods chosen by the lecturer helped to understand the course:**

	Number	Percentage
Strongly agree	8	73
Agree	3	27
Neither agree nor disagree	0	0,0
Disagree	0	0,0
Strongly disagree	0	0,0

**7.12. The teaching process included interactive methods:**

	Number	Percentage
Strongly agree	3	27
Agree	7	64
Neither agree nor disagree	1	9
Disagree	0	0,0
Strongly disagree	0	0,0

**7.13. The lecturer was a good communicator**

	Number	Percentage
Strongly agree	10	91
Agree	0	0,0
Neither agree nor disagree	1	9
Disagree	0	0,0
Strongly disagree	0	0,0

**8. Comments on strengths and ways of improvement**

**8.1. How do you evaluate the course quality**

	Number	Percentage
Very satisfied	3	27
Satisfied	6	55
Neither satisfied nor dissatisfied	2	18
Dissatisfied	0	0,0
Very dissatisfied	0	0,0

**8.2. How do you evaluate the course lecturer**

	Number	Percentage
Very satisfied	9	82
Satisfied	1	9
Neither satisfied nor dissatisfied	1	9
Dissatisfied	0	0,0
Very dissatisfied	0	0,0

**8.3. Could you name the main advantages of this course?**

*Content, connection to the global village, awareness; New issues; Modernity; Useful, relevant and interesting information; Became more interested in Circular economy;*

*The course material is perfectly organized; Better life choices to help planet, environment; Until this course, I thought sorting was more of a fad than a necessity and the EU's Paris*

*Agreement and plans for 2050 significantly improve the state of the world; I had not even heard of I learned a lot about the green future.*

**8.4. Which specific difficulties you encountered while studying the course?**

*Specific terms, plenty of legal documents; Information in Lithuanian; Course intensity, Nothing, I didn't have any difficulties; None.*

**8.5. Could you name the main disadvantages of this course?**

*None; I did not see any, Scope.*

**8.6. What changes would you recommend to improve this course?**

*Less topics; I don't know; More simplicity; No recommendations;*

*Less theory and more practise; Everything was good.*

### 1.3 The Course Evaluation by Teacher

Course evaluation by teacher was performed using online survey. Electronic version of the survey available at <https://forms.gle/srHZJ1ji7GyJShMm8>. Online survey was carried in the last week of the training.

**9. Evaluation of course structure and description:**

Course teacher agrees that:

9.1. The course aims are clear and well defined.

9.2. The competencies clearly describe knowledge and skills of student graduating from this course.

9.3. The learning outcomes correspond to the competencies.

9.4. The division of course hours into contact and self-learning hours is appropriate.

**10. Evaluation of course content:**

Course teacher agrees that:

10.1. The course content corresponds to the learning outcomes.

10.2. The course content is consistent.

10.3. The course topics are not repetitive.

10.4. The course content is modern.

10.5. The learning methods are appropriate to achieve the intended competences.

10.6. The assessment of competence is appropriate.

**11. Comments on strengths and ways of improvement:**

11.1. According to the teacher the main advantages of this course:

*New ways of thinking, a way forward; Exploration of different fields; Giving students understanding about challenges in the nearest future and getting ready for this.*

11.2. According to the teacher the main disadvantages of this course:

*Scope.*

11.3. The teacher recommends the main changes to improve this course:

*Maybe, more digital based learning alternatives.*

## 1.4 Conclusions

After implementation of the course “Fundamentals of Circle Economy” realized within the project „Three-level Centers of Professional Excellence: Qualification, Entrepreneurship and Innovation in the Green Economy “ the following conclusions are defined:

- The objectives of the course were achieved.
- The teacher and students highly rated the quality of course content.
- Students were satisfied with the quality of teaching.
- The knowledge and skills learned in the courses were put into practice.
- The course was properly implemented.

## 2. Technologies water supply<sup>14</sup>

### 2.1 The Course Evaluation by Students

Course evaluation by students was performed using online survey. Electronic version of the survey available at <https://forms.gle/LRbGeYi12dySA3kV8>. Online survey was carried in 2023, 16<sup>th</sup> of January. 26 students (man – 85 percent, women – 15 percent; under 20 – 15 percent, 20–29 – 46 percent, 30–39 – 27 percent, 40–49 – 8 percent, 50–59 – 4 percent) took part in the survey.

#### 7. Evaluation of course content and teaching quality

**7.1. The objectives of the course and study results, evaluation criteria were clearly defined from the very beginning of the course:**

	Number	Percentage
Strongly agree	15	58
Agree	11	42
Neither agree nor disagree	0	0
Disagree	0	0
Strongly disagree	0	0

**7.2. Assessment of the study results was appropriate:**

	Number	Percentage
Strongly agree	14	54
Agree	11	42
Neither agree nor disagree	1	4
Disagree	0	0
Strongly disagree	0	0

**7.3. The content was interesting, relevant, useful and allowed to achieve study results:**

	Number	Percentage
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<sup>14</sup> Prepared by Panevėžio kolegija/University of Applied Sciences

Strongly agree	11	42
Agree	13	50
Neither agree nor disagree	1	4
Disagree	1	4
Strongly disagree	0	0

**7.4. The course content responds to the latest scientific achievements:**

	Number	Percentage
Strongly agree	13	50
Agree	12	46
Neither agree nor disagree	1	4
Disagree	0	0
Strongly disagree	0	0

**7.5. Theory was taught in conjunction with the practical examples:**

	Number	Percentage
Strongly agree	10	38
Agree	15	58
Neither agree nor disagree	1	4
Disagree	0	0
Strongly disagree	0	0

**7.6. Theory was taught in context of the sustainable development issues:**

	Number	Percentage
Strongly agree	10	38
Agree	15	58
Neither agree nor disagree	1	4
Disagree	0	0
Strongly disagree	0	0

**7.7. The course topics were not repetitive:**

	Number	Percentage
Strongly agree	10	38
Agree	12	46
Neither agree nor disagree	2	8
Disagree	2	8
Strongly disagree	0	0

**7.8. The teaching materials were presented in an organized manner:**

	Number	Percentage
Strongly agree	10	38
Agree	12	46
Neither agree nor disagree	3	12
Disagree	1	4
Strongly disagree	0	0

**7.9. The teaching materials distributed were helpful to achieve study results:**

	Number	Percentage
Strongly agree	9	35
Agree	14	54
Neither agree nor disagree	3	12
Disagree	0	0
Strongly disagree	0	0



**7.10. Lecturer encouraged my participation, initiative and interaction during the lectures:**

	Number	Percentage
Strongly agree	13	50
Agree	12	46
Neither agree nor disagree	1	4
Disagree	0	0
Strongly disagree	0	0

**7.11. The study methods chosen by the lecturer helped to understand the course:**

	Number	Percentage
Strongly agree	13	50
Agree	12	46
Neither agree nor disagree	1	4
Disagree	0	0
Strongly disagree	0	0

**7.12. The teaching process included interactive methods:**

	Number	Percentage
Strongly agree	15	58
Agree	9	34
Neither agree nor disagree	2	8
Disagree	0	0
Strongly disagree	0	0

**7.13. The lecturer was a good communicator**

	Number	Percentage
Strongly agree	13	50
Agree	10	38
Neither agree nor disagree	2	8
Disagree	1	4
Strongly disagree	0	0

**8. Comments on strengths and ways of improvement**

**8.1. How do you evaluate the course quality**

	Number	Percentage
Very satisfied	14	54
Satisfied	10	38
Neither satisfied nor dissatisfied	1	4
Dissatisfied	1	4
Very dissatisfied	0	0,0

**8.2. How do you evaluate the course lecturer**

	Number	Percentage
Very satisfied	15	58
Satisfied	9	34
Neither satisfied nor dissatisfied	1	4
Dissatisfied	1	4
Very dissatisfied	0	0,0

**11.3. Could you name the main advantages of this course?**

*interesting, valuable, practical; curiosity, value, practicality; Interesante y novedoso; salida laboral; Conocimiento sobre eficiencia energética; Conocimientos Edar , Etap , eficiencia energetica; Un tema muy general, completo y diferente. Muy úti; De manera general, las partes de una EDAR, etc...; El conocimiento aprendido relacionado en los aspectos relacionados con el mundo del agua.; Que es un tema que interesa mucho ; Et fa veure la importancia de l'aigua; Sensibilizarse con la generación de energía renovables y el movimiento de energía verde; Sortides laborals; Hem après i entés aquells coneixements relacionats amb transformadors, etaps, edars, eficiència energètica.; Poder entender les coses mal echas; Consolidar conocimientos de energía y sostenibilidad; Aconseguim tenir una visió mes global del cicle integral del aigua; Conocimientos de los procesos de las instalaciones de agua y sus mejoras para mejor rendimiento y eficiencia energetica; Mejorar la conciencia de la gente de la importancia del agua y su uso; Poder conocer en profundidad todos los procesos y tecnologías aplicables en la gestión del agua; He podido saber mas de un tema que me interesa; Els coneixements adquirits els podré posar en practica en la meua vida laboral; Este curso nos enseña al detalle como se subministra el agua desde el medio hasta nuestros hogares. También brinda conocimiento sobre los procesos que realizaremos una vez salgamos al mundo laboral, además de concienciarnos en el proceso sobre el agua y su importancia para nuestro día a día.; Los conceptos mencionados en la teoría de este curso nos da una idea específica y fácil de entender de como se suministra el agua potable hacia nuestros hogares y todas aquellas dificultades y puntos que tenemos en cuenta para diversos calculos como cómo conseguir las presiones y el tamaño de las cañerías.*

#### **11.4. Which specific difficulties you encountered while studying the course?**

*lack of time due to work; Teoria excesiva; las materias de física y electricidad son difíciles, cuesta tiempo de verlas; Ninguna; Poca información y implicación por parte de los medios externos; Lo que más me costó fue, en que partes y como ahorrar energía, y como conseguir 0 CO2, etc...; Demasiada carga de trabajo en el conjunto de asignaturas durante el primer año de curso; No había ninguna dificultad específica; Obtens molta informació útil per la vida cotidiana; La dificultat de trobar informació una mes específica de la habitual; Falta d'algun treball aplicat a la realitat; Amb els transformadors; Obtener mucha información; para Cuando comience a trabajar; falta de prácticas de laboratorio; Ens va costar trobar les dades de consum energètic de les plantes , per així poder millorar la eficiència energètica.; Se podría facilitar ejemplos reales de auditorías .; Mucha información en poco tiempo; Ver más la parte práctica de la teoría; Me ha costado asimilar conceptos que eran nuevos para mí; Poc temari aplicat a la vida real; En mi caso personal, no encontré ningún problema destacable.; Es un concepto que sin tener ninguna idea no llegamos a comprender en la primera instancia. Debido a la dificultad de esto hay muchas personas que incluso los conceptos básicos les cuesta mucho de comprender por todo lo específico que es.*

#### **11.5. Could you name the main disadvantages of this course?**

*I can't; I can't; Demasiado nuevo y poco completo; la poca organización que hay al ser un curso nuevo; la organización y el cantidad de horas para cada uf; Poco material de prácticas; nada; Poco reconocimiento; No se puede conseguir 0 emisiones de CO2, etc...*

*La principal desventaja es que no se realiza en distintos lugares este curso teniéndome que desplazar una hora cada día para asistir a clase.; Que era algo nuevo para mí y a veces me costaba asimilar conceptos; Pocos hora de estudio; Creo que no tienen ningún inconveniente, todo lo que sea aprender sobre eficiencia energética, auditorías etc de cara a un futuro es beneficioso para la Sociedad; Falta de clases prácticas; Haver vist més casos pràcticament d'auditorías energètiques.; Tener mucha información de todo i poca útil ; Falta de salidas a instalaciones reales; Vaig trobar a faltar més visites a indústries o instal·lacions del sector del aigua; No hay desventajas; Pocos centros que hagan este curso.; La falta de visión en campo, hay mucha información mucha teoría, pero faltaría poder verlo mas en la vida real para aclarar conceptos.; Información irrelevante que tienes que buscar; poc temps*

*per posar-ho en practica avans dels examens; Hay una gran cantidad de teoría. El temario es difícil para quien no tiene experiencia o algun conocimiento previo.*

#### **11.6. What changes would you recommend to improve this course?**

*more practice; Mejor organizacion; que las materias fueran claras; mejor organizacion y mas practica. mucha teoria que no utilizaremos en el entorno laboral; Un taller de hidraulica me ha parecido muy didactico; Nothing; Enfocarlos más hacia el ámbito práctico laboral del agua; Realizar el curso en mas lugares y que las clases fueran mas reducidas.; Hacer mas cosas de laboratorio; Tè pocs centres on es far el curs ; Ser más concreto en el sector del agua, no tanto eléctrico, concretar más en el temario de estudio, no sea un abanico tan amplio.; Posar mes clases practiques o fer mes projectes aplicables a la realitat; Veure coses més coses practiques.; Menos teoría i mas ver las cosas en personas; Ampliaria temas sobre instalaciones; Tot es molt correcta; Se podría añadir el funcionamiento de un contador eléctrico para entender como gestionar mejor nuestro consume; Darle importancia a los temarios que vas a ver diariament en el oficio de este sector; Hacer más salidas, más visitas a centros de control de agua potable.; Centrarse en los conceptos principales e importantes y no tanto en detalles insignificantes; Cap canvi; Añadir mas practica, así como hacer mas hincapié los principales problemas que se están dando actualmente; Se podrían hacer más simulaciones en cuanto dimensionamiento de cañerías y alguna vista de como el agua presurizada llega a casa o se queda en el camino y dar más ayuda a la hora de hacer trabajos de este tema como proyectos de dimensionamiento.*

## **2.2 The Course Evaluation by Teachers**

Course evaluation by teachers was performed using online survey. Electronic version of the survey available at <https://forms.gle/srHZJ1ji7GyJShMm8>. Online survey was carried in 2023, 11<sup>th</sup> of January. 2 teachers (man – 50 percent, women – 50 percent; 40–49 – 50 percent, 50–59 – 50 percent;) took part in the survey.

### **12. Evaluation of course structure and description:**

Course teachers strongly agree and agree that:

9.1. The course aims are clear and well defined.

9.2. The competencies clearly describe knowledge and skills of student graduating from this course.

9.3. The learning outcomes correspond to the competencies.

9.4. The division of course hours into contact and self-learning hours is appropriate.

### **13. Evaluation of course content:**

Course teachers strongly agree and agree that:

10.1. The course content corresponds to the learning outcomes.

10.2. The course content is consistent.

10.3. The course topics are not repetitive.

10.4. The course content is modern.

10.5. The learning methods are appropriate to achieve the intended competences.

10.6. The assessment of competence is appropriate.

### **14. Comments on strengths and ways of improvement:**

11.1. According to the teachers the main advantages of this course:

*Contenido del curso adecuado para las competencias a adquirir; La visión global sobre las tecnologías que se utilizan actualment en el área de suministro de agua, así como su gestión i funcionamiento.*

11.2. According to the teacher the main disadvantages of this course:

*No encuentro desventajas a destacar; Búsqueda de información para ampliar los contenidos*

11.3. The teacher recommends the main changes to improve this course:

*No recomiendo cambios; Aumentar el uso de ejemplos prácticos y reales para que los contenidos teóricos queden claros.*

## 2.3 Conclusions

After implementation of the course Technologies water supply realized within the project „Three-level Centers of Professional Excellence: Qualification, Entrepreneurship and Innovation in the Green Economy “ the following conclusions are defined:

- The objectives of the course were achieved.
- The teacher and students highly rated the quality of course content.
- Students were satisfied with the quality of teaching.
- The knowledge and skills learned in the courses were put into practice.
- The course was properly implemented.