

**Development of Courses for Sustainable Waste
Management for Municipalities (ENCOURAGE)
2021-1-PL01-KA220-VET-000030417**



**Recommendations for curriculum and
training materials development**



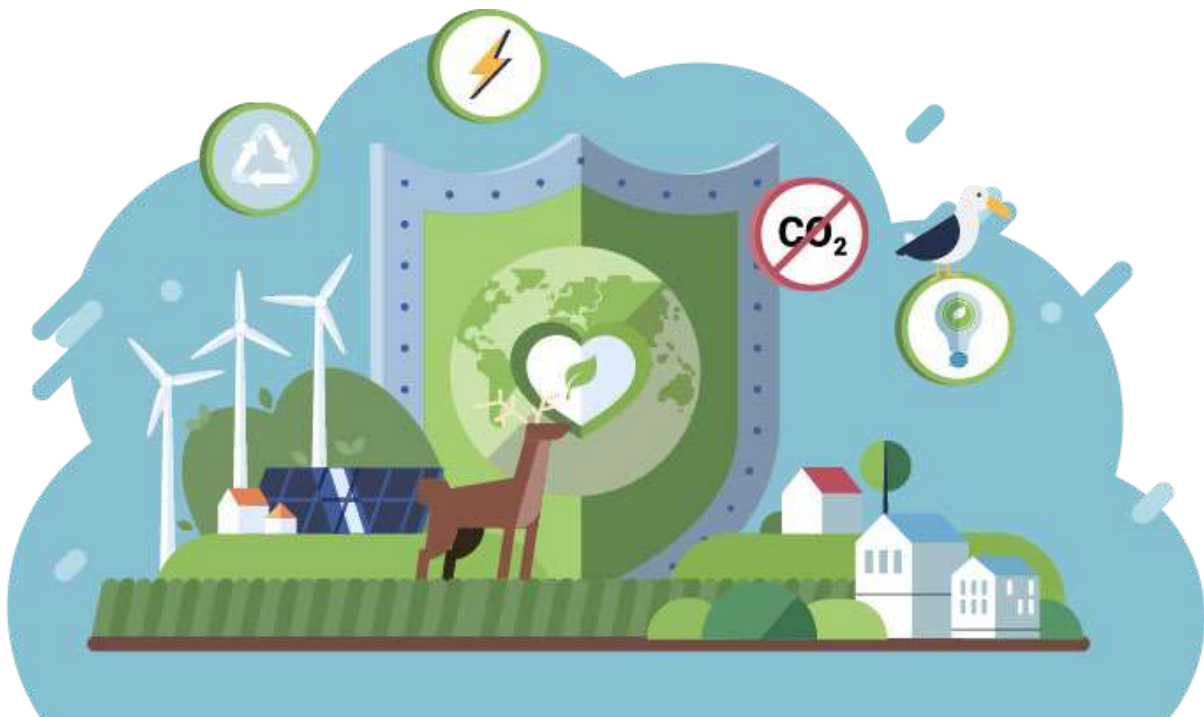
Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Education and Culture Executive Agency (EACEA). Neither the European Union nor EACEA can be held responsible for them.



This work is licensed under CC BY NC SA 4.0. To view a copy of this license, visit [CC BY-NC-SA 4.0 Deed | Attribution-NonCommercial-ShareAlike 4.0 International | Creative Commons](https://creativecommons.org/licenses/by-nc-sa/4.0/)

Table of contents

- I. INTRODUCTION
- II. SURVEY SUMMARY FOR BENCHMARK ANALYSIS
- III. SURVEY SUMMARY FOR DECISION-MAKERS OF LOCAL GOVERNMENT UNITS AND FOR EMPLOYEES
- IV. SURVEY SUMMARY FOR TEACHERS
- V. RECOMMENDATIONS



I. INTRODUCTION

The survey was conducted in four target groups:

- **decision-makers**
- **representatives from waste or environmental department within municipalities (employees)**
- **representatives from waste or environmental department within municipalities (employers),**
- **teachers.**

In total, we collected 248 survey results in five countries. The number of participants who took part in the survey was:

Cyprus - 40

benchmark analysis	13
representatives from waste or environmental departments within municipalities (employees)	6
representatives from waste or environmental departments within municipalities (employers)	7
Teachers	14

Greece – 37

benchmark analysis	13
representatives from waste or environmental departments within municipalities (employees)	7
representatives from waste or environmental departments within municipalities (employers)	8
Teachers	9

North Macedonia – 44

benchmark analysis	
representatives from waste or environmental departments within municipalities (employees)	
representatives from waste or environmental departments within municipalities (employers)	
Teachers	

Poland – 72

benchmark analysis	15
representatives from waste or environmental departments within municipalities (employees)	16

representatives from waste or environmental departments within municipalities (employers)	11
Teachers	30

Slovenia– 55

benchmark analysis	10
representatives from waste or environmental departments within municipalities (employees)	16
representatives from waste or environmental departments within municipalities (employers)	
Teachers	29



II. SURVEY SUMMARY FOR BENCHMARK ANALYSIS

Defining the challenges

The participants pointed out several problems in solid waste management. They vary from country to country. Listed below are those that the respondents consider "very serious" and "serious":

1. Lack of financial resources
2. Lack of equipment
3. Difficulties to build a standardized landfill site
4. Inadequate service coverage (some people are not given service)
5. Old vehicle/equipment frequent breakdown
6. No proper institutional set-up for solid waste management service
7. Rapid urbanization outstripping service capacity
8. Difficult to control contractual service
9. Lack of control on hazardous waste
10. Poor cooperation by Government agencies
11. Poor public cooperation
12. Lack service quality (not frequent enough, spill, etc.)
13. Uncontrolled use of packaging material
14. Lack of qualified contractors/waste management company
15. Lack of power to make financial and administrative decisions
16. Lack of trained staff

The respondents also indicated the most substantial challenges when applying requirements regarding Sustainable Waste Management, which are:

1. Lack of financial sources
2. Lack of adequate knowledge
3. Lack of adequate skills
4. Lack of appropriate feedback, in terms of profitability
5. Lack of appropriate team

As the most important sustainability skills and needs for development they indicated the following:

- Identify, quantify, verify and coordinate waste to comply with legislative requirements for sustainable waste management services, systems and facilities
- How to plan, design, implement and advance waste management projects, following the sustainable practices
- Encourage product reuse and recycling
- Use the principles of the Circular Economy and encourage the reuse and recycling of products
- Sustainable waste collection and transport practices
- What are the gaps that need to be filled in order to reach "Zero Waste" for waste management
- Research, produce and present reports to engage stakeholders in discussions to address waste management
- Sustainable practices for Waste Prevention and Recycling
- Sustainable practices for Challenges of Waste Management System

III. SURVEY SUMMARY FOR DECISION-MAKERS OF LOCAL GOVERNMENT UNITS AND FOR EMPLOYEES

I. KNOWLEDGE AND SKILLS

Management staff – the answers indicate that there is room for improving both knowledge and skills.

Employees – in most countries the respondents rate their knowledge and skills as "moderate" or "high level". However, there are also answers: "low" or "very low", especially in the „skills” section.

II. The main requirements for recruiting for positions relating to sustainable waste management

The managing staff indicated:

- General knowledge about environment, waste management, recycling
- Experience in waste management
- Knowledge of legislation
- Related degree

III. Self-assess the level of professional competencies (managing staff)

This is the area where responses in most countries tended to be "rather low" or "difficult to assess" (although there were also responses "rather high" or "high", they were fewer than in other areas):

- EU legal provisions relating to sustainable waste management in municipalities / cities
- Profitability of effective waste management
- National legal provisions relating to sustainable waste management in municipalities / cities and processing
- New recycling technologies
- Circular economy
- Methods of waste disposal and processing
- Documentation of waste management
- Waste minimization and recycling

The areas in which respondents in most countries indicated "rather high" or "high" levels are:

- General information on sustainable waste management
- Organization of waste management in municipalities / cities
- Sources of waste generation

IV. The subject of professional development in the area of sustainable waste management

in municipalities / cities that you would provide to employees?

Here we can only draw conclusions based on 3 countries, namely Cyprus, Greece and Macedonia. The reports from North Macedonia and Slovenia lacked answers to this question.

The areas in which the largest number of respondents indicated "definitely interested" or "rather interested" are:

- General information on sustainable waste management
- Organization of waste management in municipalities / cities
- Sources of waste generation
- Methods of waste disposal and processing

For Poland and Greece the following areas are of some interest (although there were also answers "rather not interested", and in the case of Cyprus this particular answer - "rather not interested" - was given by over 50-60 percent of the respondents):

- Documentation of waste management
- Waste minimization and recycling
- New recycling technologies
- Circular economy
- National legal provisions relating to sustainable waste management in municipalities / cities and processing
- EU legal provisions relating to sustainable waste management in municipalities / cities
- Profitability of effective waste management

V. Self-assess the level of professional competences (employees)

The areas where employees rate themselves the best ("rather high" or "high"):

- General information on sustainable waste management (except for Greece, where most answers were: „rather low“)
- Sources of waste generation
- Methods of waste disposal and processing (although there were also many answers: “difficult to assess” here)

The areas where there were many "rather low" or "difficult to assess" responses (although there was also a considerable number of "rather high" and "high" responses):

- Organization of waste management in municipalities / cities
- Documentation of waste management
- Waste minimization and recycling
- New recycling technologies
- Circular economy

- National legal provisions relating to sustainable waste management in municipalities / cities and processing
- EU legal provisions relating to sustainable waste management in municipalities / cities
- Profitability of effective waste management

VI. The subject of professional development in the area of sustainable waste management in municipalities / cities that you would be of particular interest to you.

There is rather small variance in the choice of interesting topics for courses and trainings. Employees are interested in improving their knowledge and skills in each of the presented areas:

- General information on sustainable waste management
- Organization of waste management in municipalities / cities
- Documentation of waste management
- Waste minimization and recycling
- New recycling technologies
- Circular economy
- Sources of waste generation
- Methods of waste disposal and processing
- National legal provisions relating to sustainable waste management in municipalities / cities and processing
- EU legal provisions relating to sustainable waste management in municipalities / cities
- Profitability of effective waste management

IV. SURVEY SUMMARY FOR TEACHERS

I. General information on the form of the course

1. As the most popular forms of training in the last three years, teachers indicated:

- Courses and trainings on new solutions in the industry in which I teach
- Courses and trainings to improve the teacher's work
- I read a lot and look for information
- Industry courses and trainings

2. When asked: „What personal skills / soft skills would you like to develop?“ most teachers chose the following answers:

- Information search and analysis skills
- Critical thinking skills
- Communication skills
- Problem solving skills
- Abilities to cooperate and collaborate
- Knowledge of foreign languages

3. The areas that teachers are most interested in to expand their knowledge and self-development are:

- **New technologies in waste management and zero waste concept, innovation**
- **Circular economy**
- **Recycling and reuse of waste, recycling of hazardous waste**
- **Environmental and waste management**
- **Knowledge of legislation**
- Communication skills

4. We received similar answers to the question: What other, specific trainings related to the subject you teach, would you like to undergo?

- **Modern methods and technologies used in water treatment**
- **Modern technologies in environmental protection**
- **Training in available software tools on circular economy**
- **Training in the field of waste management**
- **Legislation related to the environment**

5. In addition, teachers indicated the skills they would like to improve:

- Examples of good practices
- Training in the field of foreign languages
- Innovation and entrepreneurship
- Creative thinking skills
- Problem solving skills
- Team working skills

- Digital skills, computer skills

II. Ranking of thematic areas - teachers and students

1. Group I - areas of the greatest interest

The analysis of answers to the question: what topics would be interesting to teachers and students in the field of sustainable waste management in the commune, shows that we should pay the most attention to the following areas:

- Waste minimization and reuse
- Waste recycling
- General information on sustainable waste management.

2. Group II - areas of interest that might require a different approach:

Circular economy

This area scored high as a topic of potential interest among students. In the case of teachers however we can see some discrepancies depending on the country:

- for some countries (Slovenia, Greece, Poland) the topic is important, for NM there are more answers "I have no opinion", and for Cyprus 40% answered "definitely no"

- the topic "Circular economy" appeared in all countries as a response to the open question: What other, specific training related to the subject you teach, would you like to undergo?

- we can also see a large discrepancy in the answers to the question: Do you implement a circular economy in your school? Some countries are active in this area in schools (Slovenia, North Macedonia), some only partially or not at all (Poland, Cyprus, Greece)

- the question: What circular economy activities can you propose in order to improve the sustainable waste management in your school? also shows a large proportion of respondents expressed that they did not have enough knowledge and experience in this area, so they did not make any suggestions.

Methods of waste disposal

In 4 out of 5 countries there were responses "I have no opinion" (Cyprus, Macedonia, Poland, Slovenia). This can be interpreted in the way that not every teacher knows exactly how activities related to this area could be implemented in schools

3. Group III - most answers "I have no opinion", "rather not" or "definitely not"

Such responses are the most common in the following areas:

- Source of waste generation
- Organization of waste management in municipalities



V. RECOMMENDATIONS FOR CURRICULUM AND TRAINING MATERIALS DEVELOPMENT

1. Target group

In relation to the assessment of knowledge and skills we should aim at the group with moderate skills. However, since some employers and employees position themselves in the group of experts ("very high level" or "high level"), we should also include information on new technologies and new solutions in our course, also because both groups indicated "self-study" and "participation in courses/trainings" as the most popular way to expand their knowledge.

2. Preparation of training materials for employees, covering primarily the modules in which they see deficits in their knowledge and skills:

- Documentation of waste management
- Waste minimization and recycling
- New recycling technologies
- Circular economy
- Sources of waste generation
- Methods of waste disposal and processing
- National legal provisions relating to sustainable waste management in municipalities / cities and processing

- EU legal provisions relating to sustainable waste management in municipalities / cities
 - Profitability of effective waste management
 - General information on sustainable waste management
 - Organization of waste management in municipalities / cities
3. **Preparation of e-materials expanding teachers' knowledge while also useful during lessons** (new technologies, new solutions, available software tools, legislation, communications skills, digital skills, learning through observation); the question: How, in the field in which you teach, students carry out practical vocational training? was answered by many teachers with: “practical classes at school in the studio”; we can therefore assume that they would be interested in additional e-materials that would improve the quality of their work and make classes more interesting.
 4. **Consideration in the syllabus of tasks and exercises thanks to which teachers would be able to train soft skills**, such as: Innovation and entrepreneurship, Creative thinking skills, Problem solving skills, Team working skills.
 5. **Include examples of good practices** in the materials: curiosities, new solutions and innovations.
 6. **The course should cover the topics of most interest to teachers and students:**
 - Waste minimization and reuse
 - Waste recycling
 - General information on sustainable waste management

We could prepare these modules:

- at the elementary level (for teachers and students entering the subject);
 - at the advanced level (some additional materials), for the teachers interested in developing their knowledge, getting to know new technologies or good practices from other countries (the question: With whom do you cooperate within the taught subject in order to exchange experiences? teachers answer with “exchange of experiences with other teachers and schools” as their first choice), as well as legislation related to those areas.
7. **Circular economy and Methods of waste disposal modules should focus on:**

- identifying good practices from other countries;
- specific examples of how circular economy can be implemented in schools;
- real benefits of introducing a circular economy.

8. **Source of waste generation** – a smaller percentage of interest in this topic can perhaps mean that, in the teachers' opinion, they and their students have enough knowledge about this topic. Perhaps the study should then focus on less obvious sources of waste generation.
9. **Organization of waste management in municipalities** - a smaller percentage of interest in this topic can perhaps mean that, in the teachers' opinion, they have no real influence here.

In the study, we could focus on making people aware of what help municipalities should provide for schools, and what are the regulations on organization of waste management.