TREE
Micro- and project-based learning programme for Teaching ciRcular Economy and Ecological awareness in VET

Funded by the European Union

TRAINING LESSON 6 - Part 1

Title	○ **Waste management: Concept and regulations**
Part of the training course referred to in this lesson	○ X Part 1 General information about sustainability and CE Part 2 Specific Information about: □ Wood sector □ Plastic sector □ Agrifood sector
EQF level	Level 4
Where the lesson was tested	//
General Learning objective(s) according to the Bloom Taxonomy https://cft.vanderbilt.edu/guides-sub-pages/blooms-taxonomy/	□ **Create** Produce new or original work (design, assemble, construct, investigate, formulate) □ **Evaluate** Justify a stand or decision (appraise, argue, defend, critique, select, support) X **Analyze** Draw connections among ideas (differentiate, organize, relate, compare, distinguish, test, experiment) □ **Apply** Use information in new situations (execute, implement, solve, use, demonstrate, operate) X **Understand** Explain ideas or concepts (classify, discuss, describe, identify, locate, translate) X **Remember** Recall facts and basic concepts (define, duplicate, list, memorize, repeat)
Specific learning objective(s)	• *To learn about and understand the concept of waste management, related concepts and principles* • *To learn about the regulatory framework concerning waste and waste management within the EU* • *To understand that there are different actors within the sphere* • *To be able to discuss related processes and how waste management can be applied to ensure a more sustainable approach to economic activities*

Cognitive, socioemotional and behavioural outcomes based on https://www.unesco.de/sites/default/files/2018-08/unesco_education_for_sustainable_development_goals.pdf	**SDG 9 | Industry, Innovation and Infrastructure** Cognitive: the learner knows the pitfalls of unsustainable industrialization and in contrast knows examples of resilient, inclusive, sustainable industrial development and the need for contingency planning Socioemotional: the learner is able to find collaborators to develop sustainable and contextual industries that respond to our shifting challenges and also to reach new markets. Behavioural: The learner is able to evaluate various forms of industrialization and compare their resilience. **SDG 11 | Sustainable Cities and Communities** Cognitive: The learner is able to evaluate and compare the sustainability of their and other settlements' systems in meeting their needs particularly in the areas of food, energy, transport, water, safety, waste treatment, inclusion and accessibility, education, integration of green spaces and disaster risk reduction. Socioemotional: The learner is able to feel responsible for the environmental and social impacts of their own individual lifestyle. **SDG 12 | Responsible Consumption and Production** Cognitive: The learner understands production and consumption patterns and value chains and the interrelatedness of production and consumption (supply and demand, toxics, CO2 emissions, waste generation, health, working conditions, poverty, etc.). Socioemotional: The learner is able to communicate the need for sustainable practices in production and consumption. Behavioural: The learner is able to plan, implement and evaluate consumption-related activities using existing sustainability criteria.
Green skill(s) addressed	□ Creative problem-solving □ Forward-thinking X Monitoring skills X Analytical skills X Lean production □ Maintenance and repair skills □ Pollution prevention □ Management skills X Impact quantification X Life-cycle management □ Science skills X Waste management X Environmental auditing □ Ecosystem management

	X Eco-design Other_____
Duration	20 min.
Structure and content of the lesson	**Intro: What is Waste Management? Waste Prevention and Management** Waste management can be understood as ”a system used to dispose, reduce, reuse, and prevent waste. Possible waste disposal methods are recycling, composting, incineration, landfills, bioremediation, waste to energy, and waste minimization.” Different countries take different approaches to waste management. Within this lesson we will focus on the regulations and approach of the European Union. According to the official statistics published by the Commission, the average European citizen generates around 5 tonnes of waste a year, of which only a limited share (39% for 2014 with a total EU waste production of 2,6 billion tonnes) is recycled. Much of the rest still ends up in landfills or incinerators. As this is not a sustainable practice, it is essential to improve efficiency and use of waste whenever possible. Safe and sustainable management of waste is crucial. Preventing products and materials from becoming waste for as long as possible and turning waste that cannot be avoided into a resource are key steps to achieve a greener, more circular economy. The EU Waste Framework Directive, which will be presented in detail in the following section, has two key objectives: to prevent and reduce the negative impacts caused by the generation and management of waste and to improve resource efficiency. The Directive defines a 'hierarchy' to be applied by EU Member States in waste management. Waste prevention and re-use are the most preferred options, followed by recycling (including composting), then energy recovery, while waste disposal through landfills should be the very last resort. ○ The waste hierarchy  Graph published by the European Commission, available at: https://ec.europa.eu/environment/green-growth/waste-prevention-and-management/index_en.htm

Topic 1 Types of waste- categories

Waste is a broad term that covers a lot of categories. Within the EU, a number of directives have been issued, regulating specific types of waste, namely:

- Batteries and accumulators
- Biodegradable waste
- Construction and demolition waste
- End-of-life vehicles
- Landfill waste
- Mining waste
- Packaging waste
- Polychlorinated biphenyls and polychlorinated terphenyls (PCBs/PCTs)
- Restriction of Hazardous Substances in Electrical and Electronic Equipment (RoHS)
- Sewage sludge
- Ships
- Waste containing POPs
- Waste oil
- Waste shipments
- Waste from Electrical and Electronic Equipment (WEEE)

Topic 2 The Waste Framework Directive

EU waste policy aims to contribute to the circular economy by extracting high-quality resources from waste as much as possible.

The Waste Framework Directive is the EU's legal framework for treating and managing waste in the EU, adopted in 2008. It introduces an order of preference for waste management called the "waste hierarchy" as well as the " polluter pays principle" also known as PPP. This Directive is considered to be the cornerstone of all related legislation and it sets the basic definitions in the field. The main principles of waste management that are introduced through this Directive are that waste be managed:

- " *without endangering human health and harming the environment*
- *without risk to water, air, soil, plants or animals*
- *without causing a nuisance through noise or odours*
- *without adversely affecting the countryside or places of special interest.*"

There are three main targets within the Directive that Member states need to comply with and report on in accordance with Commission Decision 2011/753/EU. The targets contained in the Directive are as follows:

- " *by 2020, the preparing for re-use and the recycling of waste materials (such as paper, metal, plastic and glass) from households shall be increased to a minimum of overall 50 % by weight*

- *by 2020, the preparing for re-use, recycling and other material recovery, including backfilling operations using waste to substitute other materials, of non-hazardous construction and demolition waste shall be increased to a minimum of 70 % by weight*
- *by 2025, the preparing for re-use and the recycling of municipal waste shall be increased to a minimum of 55 %, 60% and 65% by weight by 2025, 2030 and 2035 respectively.*"

All Member states are required to report on their progress and implementation annually or every two years, with the data being published on Eurostat. The latest report was published in 2018. An early warning report was later made available concerning the states that were at risk of missing the 2020 target of 50% preparation for re-use / recycling for municipal waste. Due to amendments in several regulations, including this Directive, the reporting requirements have changed. The next reports are due in 2022. This year, the "Commission launched a public consultation on the revision of the Waste Framework Directive (WFD), including setting of EU food waste reduction targets. The revision aims to improve the overall environmental outcome of waste management in line with the waste hierarchy and the implementation of the polluter pays principle. The public consultation is open for feedback until 16 August 2022."

Topic 3 End of Waste Criteria

End-of-waste criteria specify when certain waste ceases to be waste and becomes a product, or a secondary raw material.

According to Article 6 (1) and (2) of the Waste Framework Directive, certain specified waste ceases to be waste when it has undergone a recovery operation (including recycling) and complies with specific criteria, especially when:

- the substance or object is commonly used for specific purposes
- there is an existing market or demand for the substance or object
- the use is lawful
- the use will not lead to overall adverse environmental or human health impacts

These criteria for specific materials are set by the Commission through the "comitology" procedure.

Topic 4 Regulations on specific types of waste

As previously mentioned, the EU has prepared and published specific regulations related to certain types of waste. Once there is a Directive, it should be followed by all member states, with an implementation procedure. The Commission also provides guidelines for the implementation and integration into existing local systems. Most Directives have a consolidated version, are regularly updated and are supported by Secondary law. These can

	be found on the EU Commission's website, however some can be found below **a. Waste Framework Directive** • Waste Framework Directive • Summary of the Waste Framework Directive **b. End of life vehicles** • Directive on end-of-life vehicles • Directive on end-of-life vehicles (consolidated version) • Summary of EU Waste Legislation on ELVs **c. Landfill waste** • Landfill Directive • Landfill Directive (consolidated version) • Summary of Landfill Directive • Waste Framework Directive **d. Packaging waste** • Packaging Directive • Packaging Directive (consolidated version) • Summary of EU law on packaging and packaging waste • Plastic Carrier Bags Directive **Secondary law** Communication on beverage packaging, deposit systems and free movement of goods It is important to note that in addition to the waste management regulations, the EU has released guidelines and standards for marking and identification, as well as reporting by Member States. Examples of that can be found below. **Marking and identification** • Decision establishing the identification system for packaging materials **Data and reporting** • Directive standardizing and rationalizing reports on the implementation of certain Directives relating to the environment An example of an increasingly important and largely implemented regulation is WEEE, the Waste Electrical and Electronic Equipment Directive. More and more companies are turning to this Directive due to rise in the use of electronics and technology in every part of our lives. The Directive itself is available here: • WEEE Directive

	• WEEE Directive (consolidated version) **Topic 5 Waste prevention programmes** Perhaps the biggest ambition the EU has had in terms of waste is in fact waste prevention. Already before 2013, the Waste Framework Directive required Member States to establish Waste Prevention Programmes (WPPs) by the end of that year. The goal was and still is to limit the amount of waste generated as well as to establish strategies related to "circular economy" and reintroducing waste back into the production cycle whenever possible. In order to support Member States, the Commission has published guiding documents: • Guidance document to support Member States to develop WPPs • Specific guidelines on preparing food waste prevention programmes The European Environment Agency (EEA) reviews progress made towards the completion and implementation of the waste prevention programs. **Conclusion** Waste management is one of the more heavily regulated sectors in the EU and is one of the key elements on the road to sustainability. The different types of waste, the existing prevention and management programmes and guidelines are comprehensive, however there are still gaps and further steps that need to be taken. The related regulatory requirements have set a framework for action companies, entire industries and even states, but responsibility for each actor remains crucial.
References	Waste and recycling, Environment, European Commission, as seen at: https://environment.ec.europa.eu/topics/waste-and-recycling/waste-law_en Waste, Eurostat, as seen at: https://ec.europa.eu/eurostat/web/waste/overview Directorate-General for Environment, (2022), Waste and recycling: Commission seeks views on revision of the Waste Framework Directive, European Commission, as seen at: https://environment.ec.europa.eu/news/waste-and-recycling-commission-seeks-views-revision-waste-framework-directive-2022-05-24_en Waste prevention and management, European Commission, as seen at: https://ec.europa.eu/environment/green-growth/waste-prevention-and-management/index_en.htm
Interactive questions for R3	1. What is the main EU regulation, governing waste management? a) WEEE b) WPP **c) WFD**

	2. How many specific types of waste are regulated by the EU? a) 12 **b) 15** c) 10 d) 19
Keywords	Waste management, directive, regulation, end-of-waste
Questions for reflection	1. To what extent do local regulations in your home country align with the EU? 2. Discuss what is the current status of waste management in your home country and suggest ways to improve or expand the ways it is done.
Additional resources	Waste Management Safety Lessons: https://www.edapp.com/course/waste-management-safety/ Summary of all legislation, related to waste: https://www.municipalwasteeurope.eu/summary-current-eu-waste-legislation Waste no more: Introducing Europe's new waste laws: https://eeb.org/waste-no-more-introducing-europes-new-waste-laws/ Examples of organisations/companies, working with waste management: https://www.eurits.org/ https://www.iswa.org/ European Week for Waste Reduction: https://ewwr.eu/ The European List of Waste provides common terminology for classifying waste across the EU. This helps manage waste, including hazardous waste. Codes are assigned in a broad variety of activities, including the transport of waste, installation permits (which often refer also to specific waste codes), or as a basis for waste statistics. Study to Identify Member States at Risk of Non-Compliance with the 2020 Target of the Waste Framework Directive and to Follow-up Phase 1 and 2 of the Compliance Promotion Exercise, Good practice appendix; Data appendix; Country reports
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