The 3R's

Take the challenge and start the 3R's: Reduce, Reuse, Recycle.
Promoting zero-waste lifestyle among adults.

Curriculum

Co-funded by the
Erasmus+ Programme
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Content

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The 3R's - Take the challenge and start the 3R's: Reduce, Reuse, Recycle. Promoting zero-waste lifestyle among adults.
Curriculum

Intellectual Output: IO1/A3

1. GENERAL

Program Title	**Take the challenge and start the 3R's: Reduce, Reuse, Recycle. Promoting zero-waste lifestyle among adults.**
Aim	The project aims to develop tools based on the 3R's approach to allow the empowerment of the non-informed people. The project addresses the main problem of our society now namely climate change and shows the activities which can be taken now by the people in European countries. This training content will let the target group achieve new knowledge and skills. Moreover, the project will improve the awareness of the importance of the clean environment and encourage target's group participants to develop their competences. We want to empower local communities to rethink their relationship with resources by supporting them with independent knowledge and streamlined tools to drive change more efficiently.
Target Group	In most European countries, a majority of people say there is little or no litter where they live, although this is not the case in a few Member States (like Slovakia, and Poland where more than four out of ten people consider there is a lot or quite a lot of rubbish where they live). Also, a vast majority of adult Europeans consider that a more efficient use of resources would have a positive impact on the quality of life (86%) However, the survey on glass recycling shows that it is the elder Europeans who appear to be most informed of the infinite recyclable characteristics of certain products. The 60+ age group recycles practically all of their packaging and generally outperforms the 18-29 age group. Therefore, we want to focus on young adults in East European countries mostly to show the good practices and help the people to improve their life standards. As the problem of waste concerns all the EU and also associated countries it requires transnational approach.
Goals	The aims at people to participate in zero-waste lifestyle with the aim to maximize resources and energy and to reduce the amount of waste that ends up in landfills, deviating the amount of materials and resources in order to re-use them and include them in recycling schemes. We want to empower local communities to rethink their relationship with resources by supporting them with independent knowledge and streamlined tools to drive change more efficiently.

2. CONTENT

2.1. Specific Topics

Topic	Duration
Module 1: Introduction - the idea of zero waste	1 hour
Module 2: Shopping and food	1 hour
Module 3: Beauty products	1 hour
Module 4: Cleaning products	1 hour
Module 5: Saving energy	1 hour
Module 6: Saving water	1 hour

2.2. Learning Outcomes

After the training program, attendees

- will have a broader understanding of practices, polices and systems in adult education about zero waste lifestyle and climate
- will have a stimulated interest and motivation for continuous learning, upgrade on previous knowledge on zero waste lifestyle, new information, new competence
- will have sustainable education with long-term effects, lasting skills
- will understand the aspects zero-waste lifestyle and its sustainability
- will have an improved awareness of the importance of the clean environment

2.3. Learning materials and readings

Materials for each module will be available at the project webpage 3rproject.eu.

2.4. Training providers

The consortium partners will present the program to trainers during multiplier events.

2.5. The organization of educational process

- Individual work
- Group work

- Extracurricular materials

2.6. Assessment

Methods of learning outcomes verification

- Involvement in teamwork
- Activity during classes
- A centralized pilot testing with skilled farmers and experts.

3. MODULES

MODULE 1: Introduction - the idea of zero waste

General

The topic of the Module	Introduction - the idea of zero waste
Duration	1 hour

Specific Topics

Topic
Definition of "zero waste"
The problem of waste, excessive use of water and energy
'Zero waste' and the '3Rs - environmental benefits
'Zero waste' and '3R' areas: Shopping and food, Beauty products, Cleaning products, Saving energy, Saving water
How to change your habits? Tips, examples, good practices
Selected organizations and institutions dealing with the topic of 'zero waste'
Useful links, applications

Summary

The module aims to deepen the knowledge of the idea of "zero waste", which means striving to minimize the production of waste, and thus protect nature. This principle is based on the pursuit of the 3R principle: reduce, reuse, recycle. Reducing means shopping wisely and using everything we buy, minimizing what ends up in the trash. Reusing things means we don't throw them away senselessly. We always think about whether a given thing can be used in a different way or sold or donated.

The definition of "zero waste" adopted by the Zero Waste International Alliance (ZWIA) indicates that it is "the protection of all resources through responsible production, consumption, reuse and recovery of all products, packaging and materials, without burning them, and without discharging them to the ground, water or air that endanger the environment or human health ". "Zero waste" can also be treated as a lifestyle in which people try to generate as little waste as possible and at the same time not to pollute the environment.

Learning Outcomes

After this course attendees will

• know what "zero waste" is,
• be aware of the big problem of overconsumption and production, as well as the consumption of water and energy
• know why it is worth using the "zero waste" principle in everyday life
• know the areas in which this principle can be applied
• know what to do to change their habits
• knew selected organizations and institutions dealing with the topic of "zero waste" and will find out where to find more useful information (links, applications)
Course participants will learn:
• what “zero waste" is,
• why it is worth following this principle
• in what areas it can be used
• what to do to change your habits
• what organizations and institutions deal with the topic of "zero waste"
• where to find additional information related to this topic

Guiding Concepts

Respecting the idea of "zero waste" means striving to minimize waste production. This principle is based on the pursuit of the 3R principle: reduce, reuse, recycle. Reducing means shopping wisely and using everything we buy, minimizing what ends up in the trash, as the breakdown of what we throw away can take decades to hundreds of years. Reusing things means we don't throw them away senselessly. We always think about whether a given thing can be used in a different way or sold or donated.

The cornerstone of waste management in the EU is the five-step waste hierarchy established in the Waste Framework Directive. It describes the order of preferences in waste management and disposal: waste prevention is the preferred way, sending waste to landfills should be the last option.

Facts about water on Earth. Water covers as much as 71% of the Earth's surface and includes mainly seas, oceans, rivers, ponds and lakes. The largest part (97.5%) is occupied by the oceans - however, these waters are unfortunately unfit for consumption due to their salinity. Only 2.5% of the world's water resources are freshwater, but some of them are trapped in glaciers, and only 1% of the world's water resources are drinking water. These are the reasons why we should especially focus on saving water resources.

Guiding Questions

• What is "zero waste"?
• How big of a problem is overconsumption and production, as well as water and energy consumption?
• Why is it worth using the "zero waste" principle in everyday life?
• In what areas can this principle be applied?
• What to do to change your habits?
• What organizations and institutions deal with the topic of “zero waste” and where can I find more useful information (links, apps)?

Vocabulary

The definition of "zero waste" adopted by the Zero Waste International Alliance (ZWIA) indicates that it is "the protection of all resources through responsible production, consumption, reuse and recovery of all products, packaging and materials, without burning them, and without discharging them to the ground, water or air that endanger the environment or human health ". "Zero waste" can also be treated as a lifestyle in which people try to generate as little waste as possible and at the same time not to pollute the environment.

Resources & Links

https://zero-waste.pl/
https://zerowasterzy.pl/
https://www.nanowosmieci.pl/
https://naszesmieci.mos.gov.pl/
https://ekowymiar.pl/blog-o-ekologii/
https://www.ograniczamsie.com/

https://odpadyblog.pl/
https://ekowarszawianka.pl/
https://waste-less.pl/
https://www.youtube.com/c/AniaGemma/featured
https://www.youtube.com/c/AgataBokiej/featured

MODULE 2: Shopping and Food

General

The topic of the Module	Sustainability issues and solutions in the shopping and food sector.
Duration	**1 hours**

Specific Topics

Topic
The transformation towards sustainable shopping
The food waste issue
The Environmental Impact of Food Waste
Reducing food waste:
The sustainability of the food chain
Short Food Supply Chains (SFSCS)

Summary

The aim of this modul is to raise awareness on sustainability issues and solutions around the topic of shopping and food. The introducing how sustainability is becoming more and more important both for customers, and stores. We also will look into the food waste issue, and will dig deeper in its causes, consequences and ways of reduction in the amount of wasted food, which will lead us to the introduction of a more sustainable food supply chain.

Learning Outcomes

After this course attendees will

- be clear about the importance of a sustainable shopping approach
- know how they can contribute to the transformation towards a more sustainable shopping system
- have a general knowledge about food waste
- be clear about the environmental impact of food waste
- be able to implement a behavioural change to reduce food waste
- have a general idea of the food supply chain and about it's issues
- have a knowledge about a more sustainable food supply chain

- have clear ideas about how they can contribute to a more sustainable supply chain

Guiding Concepts

- Incorporating sustainability practices and policies into stores will be even more important in the future.
- Shop in a store that has a sustainable approach! (on-site recycling bins, locally made/grown products, points/prizes for waste, biodegradable bags, wider variety of sizes to help limit food waste
- The direct economic consequences of food wastage (excluding fish and seafood) run to the tune of $750 billion annually.
- One-third of the food produced every year (1.3 billion tonnes) gets wasted.
- One-fourth of the food currently lost or wasted globally would be enough to feed all the hungry people in the world
- “Food loss” typically refers to food lost in earlier stages of production such as harvest, storage and transportation.
- “Food waste” refers to items that are fit for human consumption but thrown away, often at supermarkets or by consumers.
- Food waste has a huge negative environmental impact. When edible items are discarded, all the resources required to bring food from the farm to your table: water for irrigation, land for planting, fuel for powering harvest and transport vehicles are wasted as well.
- Reducing food waste starts with smart shopping!
- Food production has a significant impact on the environment. The way we produce and consume food is hurting the planet and ourselves.
- Our food is sustainable if it protects ecosystem biodiversity, accessible and culturally acceptable, economically fair and affordable, safe, nutritionally adequate, and healthy, optimises natural and human resource use
- SFSCs are the key to re-localized economy but also of a new, more eco-friendly, democratic and social system.
- SFSCs have great economic and social benefits. They involve a limited number of economic operators, committed to co-operation, local economic development, and close geographical and social relations between producers, processors and consumers.

Guiding Questions

1. Why is it important to shop at store that has a sustainable approach?
2. How to do shopping sustainably?
3. What is food waste?
4. What are the environmental consequences of food waste?
5. How to reduce food waste?
6. When food is sustainable?
7. What is SFSC?
8. What are the social and economic benefits of SFSCs?

Vocabulary

Sustainability - the ability to be maintained at a certain rate or level. Avoidance of the depletion of natural resources in order to maintain an ecological balance.
Food loss - typically refers to food lost in earlier stages of production such as harvest, storage and transportation.
Food waste - refers to items that are fit for human consumption but thrown away, often at supermarkets or by consumers.
Environmental impact - refers to the direct effect of socio-economic activities and natural events on the components of the environment.
Greenhouse gases -a gas that contributes to the greenhouse effect by absorbing infrared radiation. Carbon dioxide and chlorofluorocarbons are examples of greenhouse gases.
FAO - The Food and Agriculture Organization (FAO) is a specialized agency of the United Nations that leads international efforts to defeat hunger.
United Nations - The United Nations is an intergovernmental organization aiming to maintain international peace and security, develop friendly relations among nations, achieve international cooperation, and be a centre for harmonizing the actions of nations. It is the world's largest, and most familiar, international organization.
Food supply chain - A food supply chain or food system refers to the processes that describe how food from a farm ends up on our tables. The processes include production, processing, distribution, consumption and disposal.
Food processing and production - Food processing particularly refers to the processes used for changing the raw materials into finished edible product. Food production on the other hand refers to processes for making the food ready to eat.
Global food production industry - It is a complex, global network of diverse businesses that supplies most of the food consumed by the world's population. The term food industries covers a series of industrial activities directed at the production, distribution, processing, conversion, preparation, preservation, transport, certification and packaging of foodstuffs.

MODULE 3: BEAUTY PRODUCTS

General

The topic of the Module	Introduction to beauty products
Duration	1 hour

Specific Topics

Topic
Legal regulation of beauty products
Beauty products and environmental protection
Use of harmful substances in beauty products and the effect on human
Creation of friendly environment in the field of beauty products
Examples of the good practice

Summary

The aim of this module is to reveal the peculiarities of beauty products manufacture. The manufacture, use and selling of beauty products are regulated by rather comprehensive legal framework. The important issue is the amount of waste products and packages left after the beauty treatments or the use of beauty products. The beauty industry is constantly growing and expanding, however more and more alternatives for the traditional beauty industry are emerging and concentrating on the creation of sustainable cosmetics. The simple example is the switching from traditional shampoo to dry, solid shampoo without packaging. The changes show that sustainability, saving of natural resources, and environmental protection are important for the manufacturers of beauty products. In addition, the attention should be paid to the changes in consumers' attitude towards low-quality products. On the other hand, it should be noted that the production is imposed by more requirements of responsibility, regarding animal testing for beauty products, use of sustainable substances, etc. The beauty industry is highly dependent on consumers who have the impact on the level of sustainability and environmental friendliness in beauty industry.

Learning Outcomes

After this course attendees will

- get acquainted with the main legal framework of beauty products;
- be able to recognize the connection between beauty products and environmental protection;
- be able to identify the use of harmful substances in beauty products;
- be able to evaluate the quality of beauty products;
- get acquainted with the sustainable beauty products, that are related to the environmental protection.

Guiding Concepts

- The definition of cosmetics is „cosmetic product' that means any substance or mixture intended to be placed in contact with the external parts of the human body (epidermis, hair system, nails, lips and external genital organs) or with the teeth and the mucous membranes of the oral cavity with a view exclusively or mainly to cleaning them, perfuming them, changing their appearance, protecting them, keeping them in good condition or correcting body odours"
- Beauty products are tested for at least five years before being displayed on the shelves or being advertised.
- Beauty products are packed. According to the different internet sources, from 120 to 150 milliards of product packages are produced in the market every single year.

Guiding Questions

1. What kind of beauty products do we use and how much?

2. Do you pay attention to the formula of beauty products?
3. Is it important if beauty product is sustainable?
4. What kind of beauty products you wouldn't use for sure?
5. What changes should be really made in the market of beauty industry?
6. Do you pay attention if the beauty product is made in your country?
7. Do you pay attention if the beauty product hasn't been tested on animals?

Vocabulary

Emulsion (fat, water, emulsifiers). This component forms the basis of the cosmetics industry. Not only natural or synthetic fats can be used in the manufacture of beauty products but also oil and fat substitutes (fat alcohols, carbohydrates, waxes, silicones, synthetic ethers). Special attention should be paid to the oil. Cold pressed oil or oil extracted in the high temperature are considered to be of the best quality, while mineral oils that are unnatural and have no useful qualities are considered to be of the lowest quality. Water makes up 60-90 percent of cosmetic products and it can be distilled or obtained by distillation from various plants. The requirements for water are sterility and cleanliness. The water should be without any admixtures because poor quality water is the first reason for the spoiling of cosmetics. Emulsifiers bind fats and water, they can be soluble and insoluble in water, natural and synthetic. The basis of the cosmetic product has no effect on the skin, it just helps for the active components to reach deeper layers of the skin. The most natural emulsifiers are bee wax or cosmetic wax, however protein (e.g. from soy or milk), starch, or plant based polymers are most often used in the creams.
Active components. These are natural biologically active additives/effective chemical derivatives (vitamins, hormones, enzymes, components of plant or marine origin, oxygen, antioxidants, etc.) and medicine. Active components have a purposive impact on skin. Medicines are inert derivatives that act biochemically and physiologically by changing the functions and structure of skin. Oxygen, that is highly effective, can be also used as an active component in cosmetics. The products containing such component produced under a licensed programme, are marked with a special sign Aquaftem®.
Preservative components or preservatives. That is an ingredient, which extends the shelf life of cosmetic product, otherwise the beauty product could be used for no longer than a week or two weeks. There are discussions all over the world what preservatives could be allowed in cosmetics. The use of preservatives is regulated by the aforementioned Regulation (EC) No 1223/2009. Unfortunately, there are no natural preservatives in the nature. It is suggested to choose water-based preservatives, that are easily soluble in water, easily synergize with other ingredients, and are statically stable. The amount of preservatives is limited. The most dangerous (should be avoided) are parabens, phenoxyethanol, formaldehyde, DMDH hydantoin, diazolidinyl urea, quaternium - 7, 15, 31, 60 (the most dangerous), isothiazolinone, ethyl diazolinum, methylchloroisothiazolinone. Vitamin E and vitamin C are also used as preservatives with other preservatives, as they do not have antibacterial proberties by themselves. The negative properties of preservatives: allergy, impact on mental health, burns, acne, poisoning, etc.
Flavouring components. The formula usually does not contain many components. In order to create scent, essential oils are used. However, it is important to know how those oils are extracted. Natural essential oils are 'friendly', whereas, synthetic oils can cause an allergic reaction. The list of flavouring components and their permissible concentration are governed by the Regulation (EC) No 1223/2009.
Parabens. The most popular parabens are the following: Metylparaben, Butylparaben, Ethylparaben, Isopropylparaben, Propylparaben, Isobutylparaben. These parabens might be found in formulas of

shampoos, creams, lotions, cleansers, and other cosmetic products. A larger amount of parabens has a negative impact on our organism since it may disrupt endocrine system, cause allergies, rash, as well as weaken the immune system. Some groups of parabens are even associated with the formation of cancer cells. The least harmful are butylparaben and isobutylparaben, that are indicated at the end of the label.

Sulfates. Those ingredients function as degreasing components and are named as sodium laureth sulfat, sodium lauryl sulfat, ammonium laureth sulfat, natrium lauryl sulfate. Unfortunately, sulfates have a negative impact on our organism. They may irritate eyes, airway, and skin. Larger amounts of sulfates in organism might damage our livers, lungs, immune system, and possibly even fertility.

Case Study

This section will be completed by the associated consortium member.

Case study title	SOLIDU the story of success
Case study content	SOLIDU started with nothing… and we mean literally nothing. Our founder Vaiva decided to get rid of all of her belongings to travel the world with only a backpack. Knowing that she was pressed for space, she encountered solid cosmetics products and marked the birth of SOLIDU as we know it!
Lesson learnt	Today, SOLIDU is an environmentally conscious, women-owned innovative cosmetics brand from Lithuania creating low-waste solid products packaged in backyard compostable boxes. We realise that plastic pollution is one of the major threats facing humanity and takes nearly 500 years to biodegrade. The cosmetics industry is a huge contributor to this plastic waste and we have decided that we need to treat our products differently.

Resources & Links

https://eur-lex.europa.eu/legal-content/LT/TXT/?uri=CELEX%3A32009R1223
https://microchemlab.com/test-category/cosmetic-testing
https://www.drogas.lt/drogas-rekomenduoja/kosmetikos-pakuociu-rusiavimas
https://www.ewg.org/the-toxic-twelve-chemicals-and-contaminants-in-cosmetics
https://www.adorncosmetics.com.au/blog/post/environmental-impact/
https://soliducosmetics.com/about-solidu/
https://9zuikiai.lt/tvarus-grozio-salonas-ar-tai-imanoma-kaune-toks-jau-yra/

MODULE 4: Natural cleaning products

General

The topic of the Module	Natural cleaning products
Duration	1 hour

Specific Topics

Topic
Harmful substances in cleaning products
Advantages of eco-friendly cleaning products Organic cleaning products (types) Organic cleaning products (ingredients)
Detergents
The effects of chemical abuse
Environmental impact of detergents Effects of detergents on human health
What can you do to clean "healthier"?

Summary

The module aims to deepen knowledge on detergents and green cleaning products, to familiarise with the substitutes of detergents, how to prepare these substitutes at home. The module also aims to raise awareness about the risks to health and the environment resulting from the use of chemical (not ecological) cleaning agents. Resignation or at least a significant reduction in the purchase of chemical products will reduce the negative impact on the environment, and above all on health. It is worth being aware, checking the composition of products, learning and looking for new solutions. You don't have to jump in at the deep end right away. By taking small steps you can introduce significant changes. Important for yourself, for the environment, and above all for the planet.

After this course, participants will:

- know how commercial cleaning products affect our health and immunity,
- will be aware of the dangers of the toxins in detergents,
- aware of how often we expose ourselves and loved ones to harmful toxins from the detergents we use to clean our homes,
- They were able to prepare on their own, from simple and commonly available ingredients: baking soda, vinegar, household soap, lemons, substitutes for detergents which are safe for health, effectively remove dirt and pollution, but do not destroy the environment,
- We are aware of the fact that environmental protection is not the only reason to use ecological products. Their use in everyday life also saves money.

Students will learn:

- what detergents are,
- about the harmfulness of detergent ingredients,
- about the harmful effects of detergents on human health,
- about the harmful effects of detergents on the environment,
- what to replace detergents with,
- learn about the natural properties of soda, vinegar, lemon, borax,

- They will learn how to use them at home, how to prepare ecological cleaning products from them, they will find out that nature is effective and cheap.

Guiding Concepts

Harmful substances in cleaning products - triclosan, reactive chlorine compounds, ammonia, phosphates, formaldehyde, MEA, DEA, TEA (foaming agents), sodium lauryl sulphate, strong preservatives, phenols, synthetic fragrances, optical brighteners.
The impact of detergents on the environment - eutrophication of water , soil degradation, increasing amount of plastic waste.
Effects of detergents on human health - irritation of the respiratory tract, skin and eyes, decline in lung function, cancer,
Division of ecological cleaning products - home-made liquids, cleaning sprays, pastes and powders, which we prepare ourselves using products such as baking soda, citric acid, vinegar, borax and essential oils, and ready-made, ecological cleaning products bought in the store.
Advantages of ecological cleaning products: composition based on health safe ingredients, do not contain enzymes, formaldehyde, optical brighteners, phosphates, petrochemical raw materials, toxic fragrances, strong preservatives, synthetic fragrances, triclosan, irritating foaming agents, are biodegradable and environmentally friendly, do not contain raw materials from dead animals, have pleasant, natural scents, are gentle to the skin, do not cause such ailments as eye tearing, pinching in the throat, shortness of breath, are safe for health and allergy sufferers.

Guiding Questions

- What are detergents?
- What harmful substances do they contain?
- What impact do they have on our health and environment?
- How can we divide green cleaning products?
- What are the advantages of eco-friendly cleaning products?
- What ingredients can you make your own cleaning products from? Please give some examples.

Vocabulary

Detergents - are chemical compounds, which are an active element of various types of washing and cleaning agents. Such compounds are contained, e.g. in washing powders, liquids for washing various surfaces, products for cleaning and disinfecting sanitary facilities, etc.
Harmful substances in cleaning products - triclosan, reactive chlorine compounds, ammonia, phosphates, formaldehyde, MEA, DEA, TEA (foaming agents), sodium lauryl sulphate, strong preservatives, phenols, synthetic fragrances, optical brighteners.
Eutrophication of waters - explained as increase of water fertility, as a result of high concentration of phosphorus and nitrogen, which enters the water bodies. Although the initial stage of this process may seem beneficial for the environment, exceeding a certain limit disturbs the biological balance, leading to intensive water bloom, strong algal and plankton growth and decline of many aquatic

species. Phytoplankton covering the entire water surface takes up a significant amount of oxygen and prevents light from penetrating deep into the water, thus stopping plant growth and animal life.
Soil degradation is a problem caused mainly by air pollution, acid rain carried by atmospheric fronts and the use of artificial fertilisers. Soil fertilization alone may therefore be insufficient. It is important to use environmentally friendly cleaning agents that do not affect the composition of the water that is released into circulation.
Soda ash - a popular ingredient in household and eco-friendly cleaning products; great for removing stubborn stains and as an ingredient in most household detergents.
Baking soda - is a popular substance in the home pantry, also used to create homemade and eco-friendly cleaning products.
Ammonia - a highly toxic substance found in bathroom cleaners and all-purpose cleaners. It irritates the respiratory system, lungs, skin and eyes.
Chlorine - a substance with strong antimicrobial properties, which is the main component of toilet bowl cleaners, mould removers, dishwasher detergents, laundry bleach and powders for cleaning bathroom fittings. A highly toxic substance that irritates the mucous membranes and respiratory system.
Sodium hydroxide - you will find it in preparations for unblocking pipes, it irritates the mucous membrane and the respiratory system.
Synthetic fragrances - can refer to thousands of chemical ingredients and cause skin allergies and nervous system and kidney ailments.

Case study title	**Gold drop** **BRAND ZIELKO - NATURAL CLEANING PRODUCTS FROM SYLVECO**
Case study content	The case study introduces Polish producers of ecological cleaning products who hold the most important quality certificates. They make sure that their products are safe for users and the surrounding environment. In the course of production they apply the principles of Good Manufacturing Practice, their products are composed of 95% to 99.9% of natural origin and are allergen- and paraben-free. They perfectly cope with typical household dirt. They are really effective.
Lesson learned	There are more and more brands on the market that create their products in the spirit of sustainability and care for the environment, thanks to which the degree of environmental degradation will be significantly reduced. Just look for it.

Resources & Links

Please list the resources and links that were used.

MODULE 5: SAVING ENERGY MODULE

General

The topic of the Module	**Module 5: Saving Energy**
Duration	**1 hour**

Specific Topics

Topic
Climate change mitigation and adaptation
Energy as a resource
Tips to save energy
Why energy use is so important
Sustainable mobility
Energy efficiency
Advantages and Disadvantages
Renewable energies
European Climate and Energy Policy

Summary

This module aims to inform the attendees on the importance of saving energy as a resource, but as well as main „creator" of climate change. Know as well the policies implemented by our governments, the clear view of the European citizenship, the advantages and disadvantages (problems/solutions). And as a final objective to learn about the possibilities of action that each citizen can implement in their daily life to get inspired to take real action.

Learning Outcomes

After this course attendees will

- Be able to know what creates climate change
- Problems and solutions related to climate change
- Learn about the general EU opinion about these facts
- Learn about green energy, energy saving and efficiency
- Understand energy as well as another resource to be taken into account to apply the 3Rs rule
- Know some specific actions to be taken to tackle this problem

Guiding Concepts

- Climate change is mainly produced by burning fossil fuels, coming mainly for the production of energy to be used in our daily lives.
- Conventional Energy is produced by depleting natural resources of our planet, and should as well sheen as a resource to be taken into account.
- EU policies and general opinion agree on taking action about climate change, by fist mitigating it and not going over 2º of global temperature rise, and at a parallel way adapt to its already proven effects.
- There are solutions to this by saving energy, using it in a better way, and producing it with renewable energies.
- We all can save energy and use it in a better way in our daily life.
- We can move better, use less energy consuming appliances, use more efficient appliances, or change our current behaviours.

Guiding Questions

- Why is energy so important?
- Who creates climate change?
- Is climate change already affecting me, will it affect me?
- From where comes the energy I use?
- Is there a solution with green energy and intelligent use of energy to the current situation?
- What can I do?
- What are renewable energies?
- Which are the renewable energies?

Vocabulary

Climate change - A change in global or regional climate patterns, in particular a change apparent from the mid to late 20th century onwards and attributed largely to the increased levels of atmospheric carbon dioxide produced by the use of fossil fuels.
Climate change mitigation - Means avoiding and reducing emissions of heat-trapping greenhouse gases into the atmosphere to prevent the planet from warming to more extreme temperatures.
Climate Change adaptation - Means altering our behavior, systems, and—in some cases—ways of life to protect our families, our economies, and the environment in which we live from the impacts of climate change. The more we reduce emissions right now, the easier it will be to adapt to the changes we can no longer avoid.
Energy efficiency and saving – Energy efficiency is the amount of energy needed to achieve a given result. As anything is more energy efficient, it menas that it needs to use less energy to achieve the same result. Energy saving means the ability to use less energy because we were sparing it before, or because it is not needed anymore.
Renewable Energies - Is energy produced from sources that are naturally replenishing but flow-limited; renewable resources are virtually inexhaustible in duration but limited in the amount of energy that is available per unit of time. Some of the main types of renewable energy sources are: Sun, Wind, and Biomass**.**
Energy as a resource- 3Rs – Energy is not only main sector that causes Climate Change, energy itself its a resource, as fosil fuels are limites, and renewable energy sources have a limites temporary

amount. So circular economy rules have to be applied as well to energy itself as another natural resource we use.

Case Study

Case study title	Energy Neighbourhoods Project
Case study content	Materials and techniques developed to achieve change of behaviour of citizens related to energy savings in the long term. This is done by using local networks and creating a campaign that lasts 4 months sending continuous energy saving tips, and giving advice to participants.
Lesson learnt	The project aimed not only to give advice to citizens, but to accompany them during a period of 4 months with follow up of their energy consumption. This way the project achieves to promote behaviour change while citizens apply a change over a period of 21 days. During the project is was proven that energy savings of near 20% could be achieved applying zero cost or low cost measures. Website: https://ec.europa.eu/energy/intelligent/projects/en/projects/en2

Case study title	European Energy 50/50 project
Case study content	This project has been applied in different EU regions to schools. In those schools some guidelines are given to develop an easy fast checking done directly by students, so they learn by doing and then they suggest some possible solutions that are coordinated by teachers. As well they work during the whole year other possibilities both at school level and at their homes.
Lesson learnt	The energy savings produce economic savings, and 50% of those go to reduce the energy bill of the school, and 50% go to prizes for students. This scheme has given it a great success, having been applied in a great numbers of schools already with real savings. Website: https://www.matchup-project.eu/news/valencia-50-50-an-educational-project-to-reduce-energy-consumption-in-schools/

Case study title	Our planet, our future. Fighting Climate change together
Case study content	An EU web platform about main causes, impacts, and solutions related to Energy Comsumption and Climate Change, and the need to take action with educative materials.
Lesson learnt	Still ongoing, but the main aim is to involve all kind of citizens with scientific knowledge and easy to learn lessons. Main website: https://ec.europa.eu/clima/sites/youth/ Teachers hub on this topic: https://ec.europa.eu/clima/sites/youth/teachers_en?field_clmtl_topic_tid_i18n=61

Case study title	The Covenant of Mayors EU initiative
Case study content	In 2008 the EU launched the Covenant of Mayors initiative in order to directly involve local administrations in the objectives of Energy and Climate, as the nearer public administration to the citizen. Since then this initiative has only

	grown both at international level, as well as in fields of action, including now specifically energy poverty and climate change adaptation.
Lesson learnt	To give local administrations and their citizenship a clear planification to get involved in the energy transition. Website: https://www.covenantofmayors.eu/

Resources & Links

Institutions:

- FEDARENER: https://fedarene.org/
- MANAGENERGY: https://www.managenergy.net/
- COVENANT OF MAYORS: https://www.covenantofmayors.eu/
- National Contact Points: https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/support/ncp

EU Policies and Facts:

- https://www.europarl.europa.eu/factsheets/en/sheet/68/energy-policy-general-principles
- https://ec.europa.eu/energy/topics/energy-strategy-and-energy-union_en
- https://ec.europa.eu/clima/policies/eu-climate-action_en
- https://ec.europa.eu/eurostat/web/climate-change
- https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Energy_saving_statistics

Facts and Educational materials:

- https://ec.europa.eu/clima/sites/youth/
- https://ec.europa.eu/clima/sites/youth/teachers_en?field_clmtl_topic_tid_i18n=61
- https://ec.europa.eu/clima/sites/youth/
- https://climate.copernicus.eu/ESOTC/2020
- https://www.edf.org/card/7-ways-climate-change-affecting-daily-life
- https://www.nationalgeographic.com/climate-change/how-to-live-with-it/index.html
- https://ec.europa.eu/clima/citizens/support_en
- https://www.climatecouncil.org.au/wp-content/uploads/2018/11/climate-action-toolkit.pdf
- https://climateoutreach.org/reports/how-to-have-a-climate-change-conversation-talking-climate/
- https://communitiesforfuture.org/get-resources/
- https://climatevisuals.org/
- https://www.unep.org/explore-topics/climate-action/facts-about-climate-emergency
- https://www.wwf.org.uk/updates/10-myths-about-climate-change
- https://ec.europa.eu/energy/intelligent/projects/en/projects/en2
- https://www.matchup-project.eu/news/valencia-50-50-an-educational-project-to-reduce-energy-consumption-in-schools/

MODULE 6: SAVING WATER

The topic of the Module	Saving water
Duration	1 hour

Specific Topics

Topic
„Grey water": Definition and Types
Obtaining, use and recycling of „Gray water"
The readiness of EU countries to introduce „Gray water" recycling systems in terms of legal and technical regulations
Czech legislation of recycling „Grey water"
Technical and legal standards for „Gray water" recycling in CZ

Summary

The aim of the module called saving water is to introduce the forms of saving water through the use and reuse of grey water, rainwater and blackwater, which is a very current topic today. The topicality of the topic can be seen regarding the environment, the financial situation and as an effective tool against the long-term problem of drought. There are also practical cases of the possibilities on the current market. At the same time, the global risk is mentioned, which lies in the lack of drinking water resources. Half a billion people around the world suffer from water shortages. Various cities are also facing this problem, and the demand for drinking water is growing very rapidly.

Learning Outcomes

After this course attendees will

- be able to characterize the vision in connection with water storage,
- be able to define rainwater, graywater and blackwater – types, form of use,
- be able to discuss issues related to the recycling of gray water,
- characterize a natural source of water such as a well,
- list the various tools and accessories that can save water,
- be able to specify technical and legislative elements in connection with the recycling of gray water,
- be able to formulate conclusions in the form of readiness of EU states for the adoption of technical and legislative rules regarding the recycling of gray water.

Guiding Concepts

- Saving water not only saves the population's wallet, but also helps the environment.
- Saving rainwater saves up to 50% per day.
- Shower vs. bathtub? Of course, the shower, saving for one wash is up to 150 liters of water.
- An economical shower head? Yes, up to half water savings.
- We definitely don't want a dripping tap at home! Wasting up to 1 liter of water per hour.

- Modern technology vs. older technology. Modern washing machines can consume only half the water than older models, ie 40-45 liters instead of the original 80-90 liters.
- Many do not turn off the water when washing hands, brushing teeth or washing hair, a mistake! It is always necessary to turn off the water to avoid unnecessary waste.
- Washers and dryers must always be switched on only if they are full, their maximum weight of the laundry is used to the maximum.
- Recycling works in simple steps: gray water becomes white water (utility water) through recycling, which is used for further use in the building, such as flushing, washing floors or watering.
- Water purification is relatively simple, so it can be handled within individual buildings.
- How much can you rely on a well?

Guiding Questions

1. Why is it important to save water?
2. Are there proven ways to save water in the home?
3. Is the use of rainwater efficient?
4. What is graywater?
5. Are there other types of water?
6. Is graywater difficult to recycle?
7. If graywater can be recycled, what is it used for?

Vocabulary

Saving water - behaving in such a way that water is not wasted.
Rainwater - water mostly obtained from rain, which is captured mostly in the form of raft from the roofs of buildings.
Gray water - got its name from the inevitable color change that occurs during longer storage. It is usually defined as wastewater from bathrooms (washbasins, showers, baths and sometimes also washing machines) that does not come into contact with black water (ie water from toilets).
Gray water extraction - this is wastewater from washbasins, showers, bathtubs and washing machines.
Use of gray water - water must first be recycled into white water, then it can be used as water for watering, rinsing or washing floors.
Gray water recycling - is very simple compared to wastewater treatment, it is possible to manage it even within your house.
Types of water: light graywater - waste water from sinks, showers, baths and washing machines, dark graywater - kitchen sinks and dishwashers, yellow water - sewage, black water - water containing faeces and urine.
Gray water legislation in the EU - Gray water management in the European Union is not yet addressed by a single piece of legislation (Regulation of the European Parliament and of the Council of the EU), although the use of treated graywater is happening more and more frequent. Each country addresses the issue individually by using the recommended ISO standards in its legislation and using Regulation (EU) 2020/741 of the European Parliament and of the Council on minimum requirements for water reuse, implementing EU directives into their legislation (specific directives used correspond to at the time the national regulation was created). These are mostly Council Directive 91/271 / EEC concerning urban waste water treatment (Guidelines on the integration of water reuse into water planning and

management in the context of the Water Framework Directive) and Directive 2006/7 / EC of the European Parliament and of the Council of 15 February 2006 on the management of bathing water quality and repealing Directive 76/160 / EC.
Well - a natural spring water well.
Perlátor - accessories for sink or washbasin faucets that save up to 50% water.
Czech legislation - There are no direct legal regulations for water reuse in the Czech Republic, only non-binding standards. Water reuse can be considered in many sectors and includes both the recycling of urban and industrial water to irrigate land; industrial use; to use non-potable and recycled water in cities for flushing toilets; for fire fighting; for environmental and recreational use, for the operation of ornamental water features, replenishment of water bodies and car washing. Last but not least, the use of gray water from households, apartment buildings, hotels and shopping centers for reuse for flushing toilets or for irrigating urban greenery or gardens.
Technical and legal standards for gray water recycling in CZ - technical standards and regulations used for system design gray water recycling in the Czech Republic. It turns out that (especially after the announced translation standards EN 16941-282) in the environment of the Czech Republic, a number of high-quality ones can be used in design practice standards (ČSN, ČSN EN and ČSN ISO). In addition, German or British are often used standards. The only major problem is the lack of data on gray production and the need for adjusted water in atypical buildings, such as office buildings, schools, etc.

Resources & Links

- De Gisi, S., et al., Grey water in buildings: a mini-review of guidelines, technologies and case studies. Civil Engineering and Environmental Systems, 2015. 33(1): p. 35-54.
- https://www.asio.cz/cz/as-gw-aqualoop
- https://www.datart.cz/novinky/uspora/vody
- https://www.vodavdome.cz/co-je-to-seda-voda/
- https://www.vodavdome.cz/vyuziti-destove-vody-na-zahrade-a-v-dome/
- https://www.mzp.cz/C1257458002F0DC7/cz/prioritni_osa_6_seznam_projektu/$FILE/ofeu-studie_sede_vody-20210517.pdf
- https://ec.europa.eu/clima/citizens/tips/water_en
- https://www.fbadvokati.cz/cs/clanky/7373-seda-voda-pomuze-bojovat-se-suchem-a-snizi-naklady
- https://spolecne-udrzitelne.cz/aktuality/inspirace/vyuziti-destove-vody
- https://www.slezak-rav.cz/novinky/uspora-vody-v-domacnosti