CURRICULUM ON CIRCULAR ECONOMY

Jaroslav Mihálik
Stela Olejárová
Jakub Bardovič
[eds.]

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Editors:
Jaroslav Mihálik,
Jakub Bardovič,
Stela Olejárová (eds.)

Contributing authors:
Raya Tsvetkova
Niya Vassileva
Andrej Ignatov
Katja Kolenc
Ana Mladenović
Denisa Karabová
Martin Maška
Ali Honaramiz
Jaroslav Mihálik
Peter Orosz
Jakub Bardovič
Asteris Huliaras
Sotiris Petropoulos

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Foreword

We live in an era which can be defined by growing environmental challenges such as rapid resource depletion and approaching the limits of our planet's capacity. For this reason, the necessity to shift from a linear "take-make-dispose" economy to a circular one has become one of the most pressing imperatives of our time. Thus, the circular economy is no longer a theoretical concept or a niche interest — it is a practical, systemic response that reimagines how we produce, consume, share, repair, reuse, and regenerate. It is a pathway toward resilience, innovation, and genuine prosperity that works within planetary boundaries.

This Curriculum on Circular Economy has been created within the framework of the Erasmus+ project **CIRCLES – Circular Economy Integration, Resources and Learning for Economic Sustainability** (Project No. 2024-1-SK02-KA220-YOU-000248572), co-funded by the European Union. Its primary purpose is to equip young people, youth workers, educators, community leaders, and lifelong learners with the knowledge, tools, and inspiration needed to understand, apply, and advocate for circular principles of circularity in everyday life and across key sectors of society.

Dedicated especially to the younger generation — those who will inherit both the consequences of today's choices and the opportunity to shape tomorrow — this material is designed for everyone who believes that change is not only inevitable but within our hands. Whether you are a student, teacher, activist, entrepreneur, or simply a concerned citizen, this curriculum speaks to you.

Content-wise, through its twelve chapters, you will gain a comprehensive understanding of the circular economy: its historical roots and core principles, the stark contrast between linear and circular systems, the role of policies and regulations, and concrete, actionable strategies in areas such as waste management, energy and water, transportation, sustainable food systems, fashion, housing, community initiatives, and the transformative potential of digital technologies. The final chapter looks boldly toward the future, showing that a regenerative, inclusive, and thriving circular society is not a distant dream but an achievable reality.

We are immensely grateful to the European Union and the Erasmus+ programme for making this project possible, and to every partner organisation that contributed expertise, passion, and countless hours to its realisation:

- Univerzita sv. Cyrila a Metoda v Trnave, Slovakia (coordinator)
- Celjski mladinski center, Slovenia
- The Future Now Association, Bulgaria
- University of the Peloponnese, Greece
- European Dialogue, Slovakia

This curriculum is the fruit of true cross-border collaboration, shared vision, and a common commitment to leaving the world better than we found it.

May this Curriculum inspire you not only to learn, but to act — to reduce, reuse, repair, share, regenerate, and, above all, to reimagine what is possible when we design systems that mimic nature's own perfect circles.

For a planet that thrives in loops rather than lines.
On behalf of the CIRCLES project consortium

Introduction to Circular Economy

Today's world is facing several major challenges, and the way we choose to address them will significantly impact the future of our planet and its inhabitants.

Introduction

The most pressing issues include increasing pressure on natural resources, environmental pollution and climate change The traditional linear economic model, based on the pattern of take, make, use and dispose, is proving to be unsustainable in the long term. As a response to these challenges, the concept of the Circular Economy (CE) has emerged. It offers an alternative approach to how we produce and consume goods, aiming to reduce waste, extend the life of products, and make better use of resources. In this chapter, you will explore the key challenges that highlight the need for a transition to a circular economy. You will also learn about its core principles and how the concept has evolved over time.

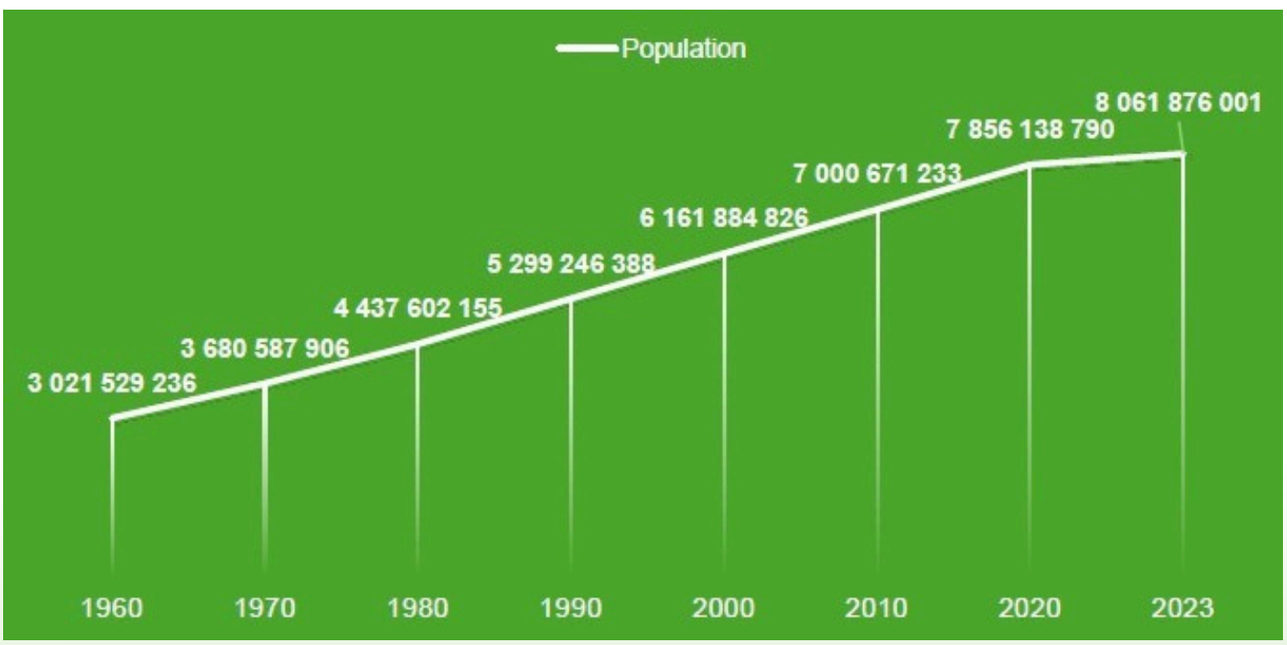
Current state and conditions

The contemporary world we live in is characterized by significant dynamism. This dynamism influences our everyday lives as well as our ways of functioning. Compared to the past, today's generation lives in a much more dynamic environment. Previously, human life was often closely tied to a single place. Many people were born, raised, and died in the same village or town. Today, however, it is entirely common for people to move throughout their lives—whether for work, study, or personal development to other cities, regions, or even countries. Such geographic mobility is one of the key features of modern society and also serves as a significant indicator of globalization. The intensity of globalization has gradually reached its current scale, also due to the advancement of modern technologies. These act as an essential driver in this process. Technological progress occurs faster than ever before. Digital devices, the internet, artificial intelligence, modern transportation means, and automation fundamentally change how we work, communicate, learn, spend our free time, travel, and consume goods and services. These changes bring numerous advantages, such as easier access to information or the possibility of remote work, but they also place new demands on individuals—such as the need for digital literacy and the ability to navigate large amounts of information.

However, it is essential not to overlook that, alongside numerous positive effects stemming from the advancement of modern technologies, there are also certain negatives which, over time, have reached dimensions impossible to ignore. These negatives encompass consequences not only for individuals but also affect society as a whole, the natural environment, and consequently, our entire planet. Long-term rising consumption— and consequently increasing demands on the side of demand—the frequent creation of artificial needs driven by successful marketing campaigns, increasingly complex production processes, and demands for the accessibility of various materials disrupt traditional perceptions of how the economy or economic systems should operate. The principle based on a linear model, beginning with materials and resources, followed by manufacturing, sales, product use, and ultimately disposal, appears unsustainable for our planet in the long run

Therefore, it is important to state that Earth does not possess unlimited dimensions and capacities. What does this limitation imply? Primarily, the planet's population is growing at a significant pace. A crucial milestone in population growth occurred around 1800 when the Earth's population first surpassed one billion inhabitants. It exceeded two billion a little

Fig. 1: Population trends since 1960 according to the World Bank

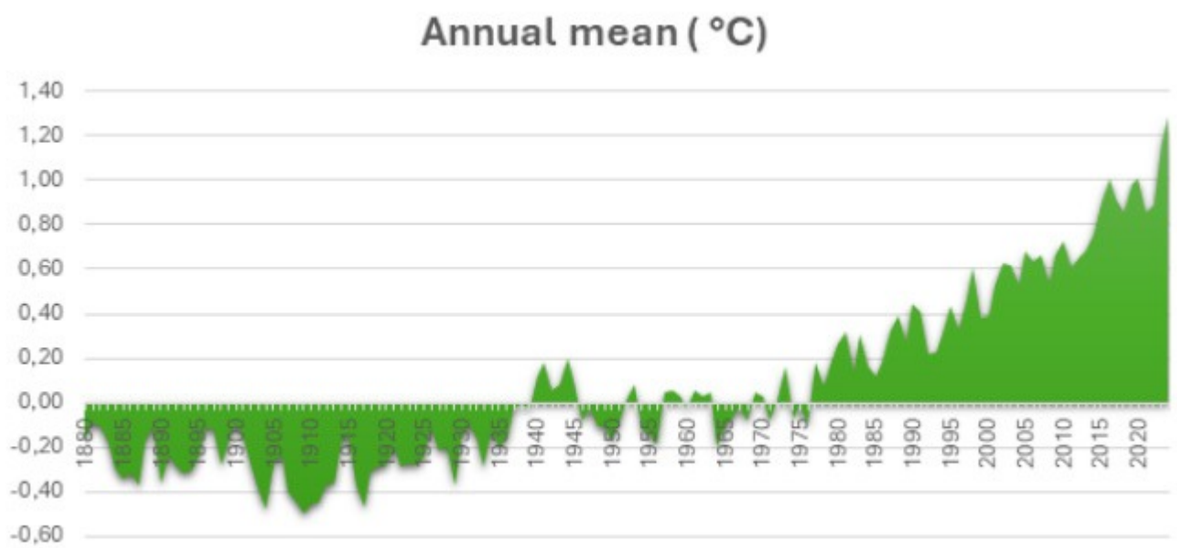


Source: World Bank Group, 2025a

more than a hundred years later (around 1920). The subsequent period, however, brought about much faster growth. Already by the beginning of the second half of the 20th century, the number of inhabitants exceeded three billion (in 1960, the population was 3.021 billion). The following decades witnessed much faster changes in the size of the Earth's population. According to the World Bank, Earth's population surpassed eight billion in 2023, reaching approximately 8.061 billion inhabitants (Fig. 1). It is anticipated that the global population will exceed 10 billion inhabitants within this century.

However, the mentioned population growth is accompanied by another reality. Due to gradual global warming, there is a risk that the proportion of uninhabitable areas on the planet will increase in the near future. According to NASA, recent years have already brought the highest average temperatures compared to the long-term average of previous recorded periods (Fig. 2). This will, on one hand, lead to forced migration, but primarily, it will ultimately reduce the total space available for the current human population, among others, to inhabit. Thus, we are observing a combination of two interrelated factors: the growth of the overall population, which will increasingly have to fit into shrinking areas of habitable territory. Naturally, this also affects other components of the natural environment.

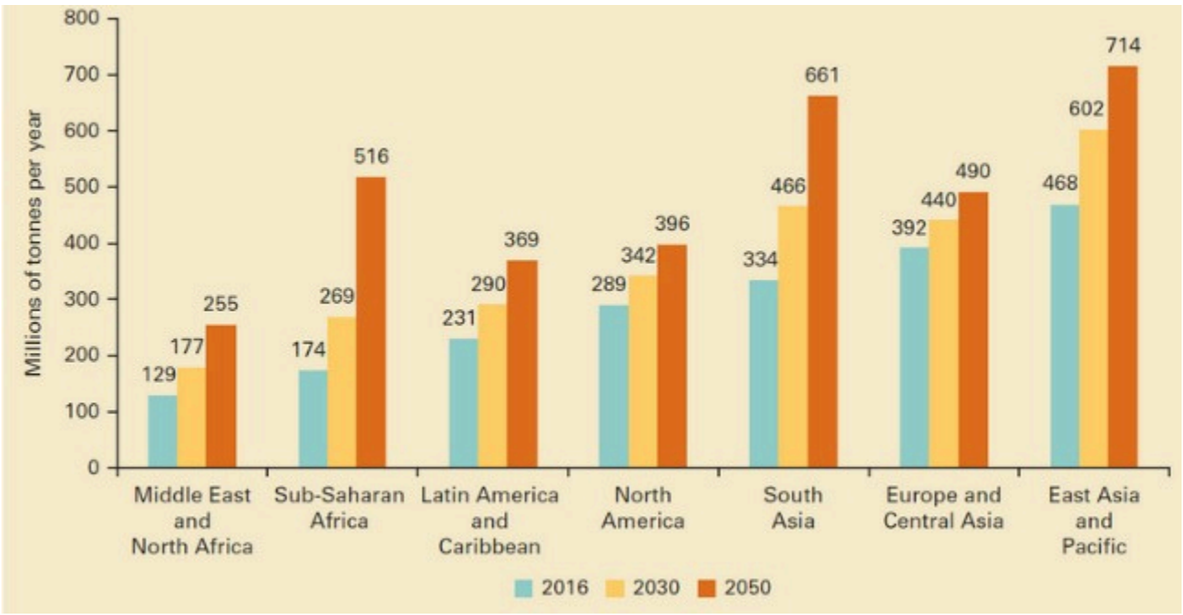
Fig. 2: Evolution of the average temperature change since 1880



Source: NASA, 2025

Secondly, limits and restricted capacities are also apparent in the realm of consumption, and thus production and consumption processes. Our planet does not have unlimited capabilities to satisfy the unlimited number of needs of an unlimited number of inhabitants. Any raw materials and resources must first be obtained (by extraction, cultivation, etc.), transported, and subsequently processed into the required form, which also imposes certain constraints on our planet's capacity. Additionally, it must not be overlooked that there is a group of resources that are non-renewable, and their depletion can significantly disrupt not only production processes. Moreover, it should be emphasized that waste generation is also an integral part of the aforementioned processes. With the growing population, increasing consumption, and the emergence of ever-new needs to be satisfied, our planet significantly faces limitations in managing this aspect as well. The following illustration shows the amount of waste produced in selected regions. As we can see in the following figure (Fig. 3), without changes in the approach to this issue, waste generation will gradually become unsustainable in the long term.

Fig. 3: Waste generation by region



Source: World Bank Group, 2025b

In line with the above, it becomes clear that such a linear model is no longer sustainable in the long term. Precisely for this reason, a counterpoint to this economic understanding has emerged, seeking to transform the logic of functioning—not only of the economy itself but also its constituent parts, namely businesses and us, individuals. It is based on the idea that there is only one planet, which has limited capacities, meaning it cannot be indefinitely "expanded." Consequently, it is necessary to shift away from a one-way line, beginning with raw materials and resources and ending with discarded waste, toward a line representing a "never-ending process." This implies that individual elements (where possible) circulate, creating conditions that reduce the volume of new inputs required and simultaneously decrease the amount of waste outputs (in the form of non-reused waste). The international community has long recognized the consequences stemming from the current structure of economies and our daily lives. It understands the importance of achieving sustainability, which currently can be fulfilled through the logic of a circular economy. For this reason, in 2015, all UN member states adopted the 2030 Agenda for Sustainable Development. This plan aims to improve people's lives and protect our planet. It is grounded in 17 Sustainable Development Goals (SDGs), calling upon all countries to collaborate (Fig. 4). The goals focus on eliminating poverty, improving healthcare and education, reducing inequalities, and promoting economic growth. Simultaneously, they emphasize environmental protection, combating climate change, and safeguarding oceans and forests.

Fig. 4: 17 Sustainable Development Goals (SDGs)

Source: United Nations Environment Programme, 2024.

The difference between a linear and a circular economy

As evident from the previous section, we distinguish two fundamental economic models:

1. The linear economic model;
2. The circular economic model.

In the case of the linear economic model, there is a clear progression from production to consumption, followed by the disposal of unwanted goods or materials as waste. It operates on the principle of "take-make-use-dispose." Its essence lies primarily in production relying heavily on non-renewable resources, often lacking attempts at their renewal or reuse. This setting inherently leads, on one hand, to the depletion of resources, and on the other, to the accumulation of unused waste. It is also accompanied by significant environmental impacts and disruption of various ecosystems. These effects are amplified further by additional factors such as population explosions with increasing demand for various goods (elements of highly consumerist behavior in a consumption-driven society) or the exploitation of cheap labor in less-developed regions. Given the planet's inherent limits, this model is significantly restrictive and, given rising demands, unsustainable in the long term. This unsustainability particularly concerns three areas: economic, environmental, and social. The circular economic model stands as the opposite to the linear economic model. It is even sometimes described as the ideal model. In certain respects, it represents a new approach based on achieving sustainability. This means that raw materials and production are not positioned at one end with unused waste at the other. The logic of this approach is built on the idea that the "life" of goods and materials does not automatically end after use. Implementing this economic model aims to ensure national competitiveness, promote stable economic growth, and secure environmental and nature protection. Its core principle relies on the more efficient use of resources and raw materials, which enter production not just once, but repeatedly, as necessary, thus forming a cycle. This creates conditions for reducing non-productive waste and also decreases demand for new (unused) raw materials and resources. Key aspects of this model include utilizing renewable resources, rental services, sharing, supporting local producers, and promoting eco-innovation. Closely linked to the circular economic model is the sharing economy. The essence of this approach is that individuals and groups collaborate in using certain goods.

These items are either rented or mutually exchanged/ shared. Such an approach is particularly common in transportation – shared cars, bicycles, or scooters have become commonplace in many European cities and beyond. Other sectors where this approach is employed include housing, parking, workspaces, and many others. You can read more about these economies and their differences in the following section.

Steps towards the idea of a circular economy

There is currently no clear consensus on the exact origins or development of the Circular Economy (CE) concept. Elements of circular thinking have existed throughout history. Even in ancient times, people often repurposed objects that had lost their original function, adapting them for new uses or modifying them into different forms. However, the importance of this approach has grown significantly in recent years, largely due to the environmental and resource-related challenges we now face. Some sources trace the roots of CE to 1966, when Kenneth Boulding introduced the idea of a cyclical ecological system capable of continuously reusing materials. He emphasized the planet's limited resources and its inability to absorb unlimited pollution, calling for a shift in how we manage materials and waste. At the same time, various scholars and practitioners have contributed to shaping the CE framework. Among them are American professor John Lyle and his student William McDonough, German chemist Michael Braungart, and Swiss architect and economist Walter Stahel. Other influential figures often mentioned in connection with the development of CE include Rachel Carson, Barbara Ward, and Herman Daly. For example, in 1972, the Club of Rome's report The Limits to Growth warned that if current growth trends continue, the world will face serious resource and pollution problems. They proposed the idea of a "growth equilibrium state" where pollution is reduced and materials are reused more often.

Later, Stahel and Reday introduced the idea of a loop economy, where resources are used more efficiently and waste is minimized. They also suggested extending the life of products and offering services instead of selling goods to reduce waste. The term "Circular Economy" was first used by Pearce and Turner in 1990. They argued that the traditional economic system turns nature into a waste dump and should be replaced by a circular model, where waste becomes a resource. Today, CE is seen as a way to reduce pressure on resources and protect the environment. However, its meaning has evolved and is now shaped by many disciplines and stakeholders from both the public and private sectors. It is also true that perceptions of the circular economic model vary not only from sector to sector, but there are also regional differences.

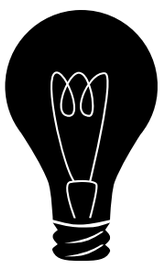
Principles of the circular economy

The fundamental principles of the circular economy include:

1. Eliminating waste and pollution
2. Circulating products and materials
3. Regenerating nature

Generally, these principles are also known as the 3Rs (reduce, reuse, recycle) or the Rs (reuse, recycle, remanufacture, reduce, recover).

The essence of these principles is that products and materials should be designed so that, after their essential use, they can return into the system. This means they don't immediately become waste. There are several ways for products and materials to re-enter the system. Firstly, they can be reused directly. A current example of such an approach is the sustainable use of clothing, where its lifecycle does not end with one user followed by disposal, but rather extends through subsequent users. Two additional methods to retain products and materials in the system without disposal involve reintroducing them into new production processes after necessary usage or recycling them entirely. Examples of recycling practices can be found in the automotive industry, though this trend has recently become apparent even with higher-end mobile phones from selected brands. Simply put, numerous examples exist across various sectors. Additionally, it should not be overlooked that these principles also encompass the sensible use of biological products. Waste generated from these can sustainably return to nature. Consequently, nature should not merely be exploited—it requires regeneration, support for the natural enivronmnet, and biodiversity.



Summary
and
Key Implications

As highlighted already in the introduction to this publication, there are several key challenges and compelling reasons why transitioning from a linear to a circular economy is essential. A growing global population, climate change, the expansion of consumer society demanding ever more resources and raw materials, and increasing waste production all confront the natural limits of our planet. Therefore, it is crucial to seek long-term sustainable behaviors among individuals. Within this context, adopting economic practices built upon circular principles appears to offer a viable solution. The following chapters of this publication will explore specific areas, illustrating where and how this model can be practically implemented.

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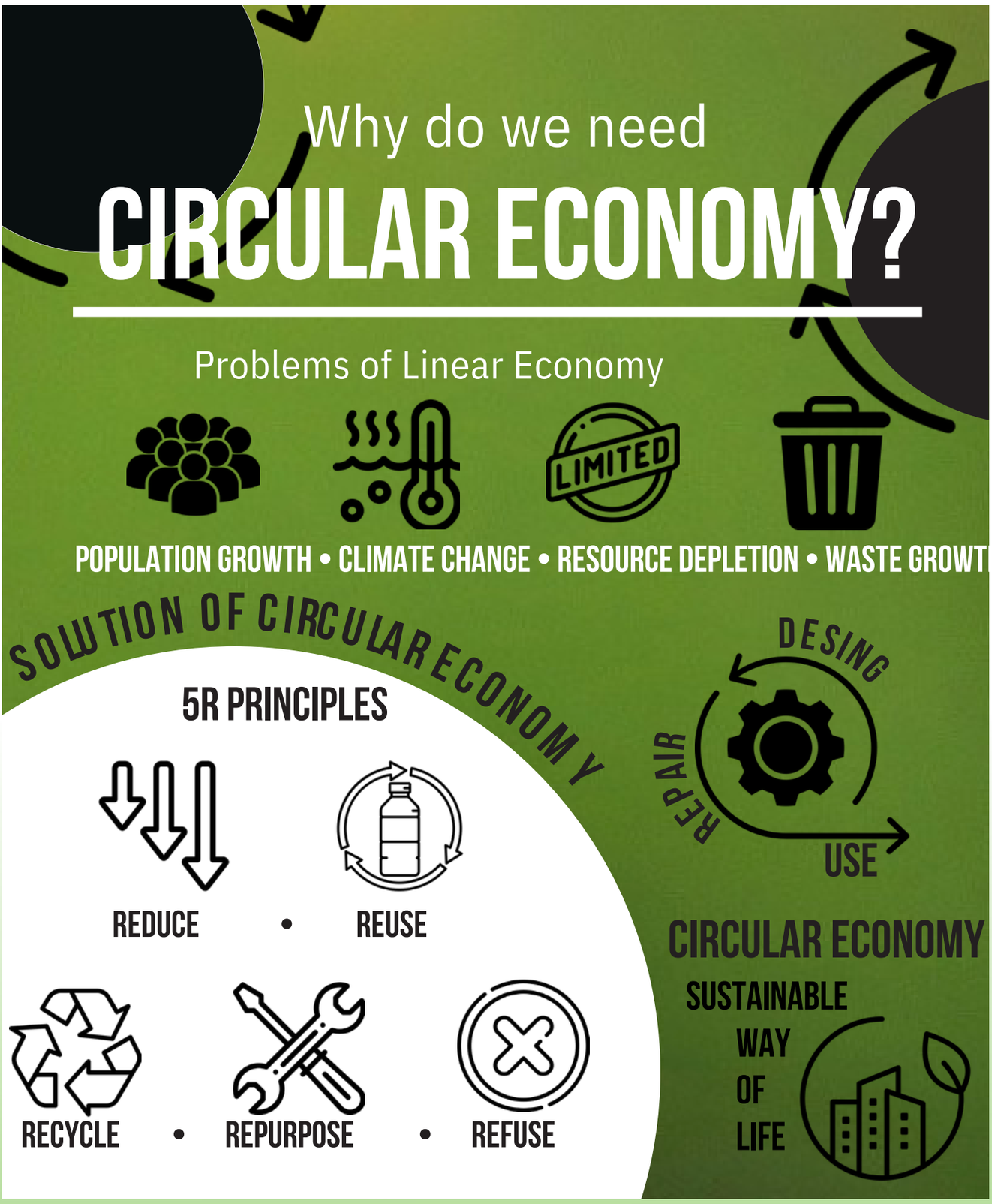
Additional Materials n°1

Video
Introduction to Circular Economy

Want to learn more?

Sustainable development goals

Global waste management outlook 2024


Why do we need
CIRCULAR ECONOMY?
Problems of Linear Economy
LIMITED
POPULATION GROWTH • CLIMATE CHANGE • RESOURCE DEPLETION • WASTE GROWT
SOLUTION OF CIRCULAR ECONOMY
5R PRINCIPLES
REDUCE • REUSE
RECYCLE • REPURPOSE • REFUSE
DESING
REPAIR
USE
CIRCULAR ECONOMY
SUSTAINABLE
WAY
OF
LIFE

Approaches to Circular Economy Concepts

Introduction

Circular economy, as we saw in the previous chapter, is a concept aiming to shift the focus from the traditional linear economy to more efficient and environmentally friendly ways of production and consumption. In this chapter our first focus will be on distinguishing the differences between linear and circular economy. We already explored the need for change in the economics field and here we will equip ourselves with a greater sense of understanding of the shift from traditional to circular economy. After we gain some knowledge in this direction, we will learn more about the main concepts and methods of the circular economy. We'll see how the circular economy creates a virtuous circle around use that includes making, repairing, refurbishing, reusing, remanufacturing and recycling. The last focus of this chapter will be on the areas the circular economy covers. Where exactly it can be implemented in our lives and in which fields we can already find circular economy methods in use.

Circular Economy vs. Linear Economy

There are some methods and concepts of the two economy types that can be perceived as identical or similar such as the production processes, the need for international supply chains, etc, though their key principles are rather different and aim for different things. The traditional economy we know is called "linear" because of the structure of its mechanism. Before the use of the product there are steps, followed consistently as raw materials are transformed into products and distributed to customers. After their lifetime and usability is exhausted they end up as waste. As we see the linear economy follows the "take, make, dispose" approach. This process is unidirectional. There is the possibility to incorporate recycling and to make the usage of the materials last longer but the circular economy method gives even longer life for products and materials. Overall the focus of the linear economy is profit and earning money, but in a world in which many of the resources are nonrenewable there needs to be a way to both keep the economy going and improving while making sure our environment doesn't suffer because of that. On the other hand the circular economy adopts a different approach. Its aim is to minimize the use of raw materials by making the product designs more durable, repairable and recyclable. With that approach the waste remains small, the business owners are encouraged to use renewable energy, the companies foster innovation and the focus shifts from "take, make, dispose" to "reduce, reuse, repair and recycle". Many studies point out that the upsides of the circular economy method are already acknowledged and the transition from linear to circular economy has already begun.

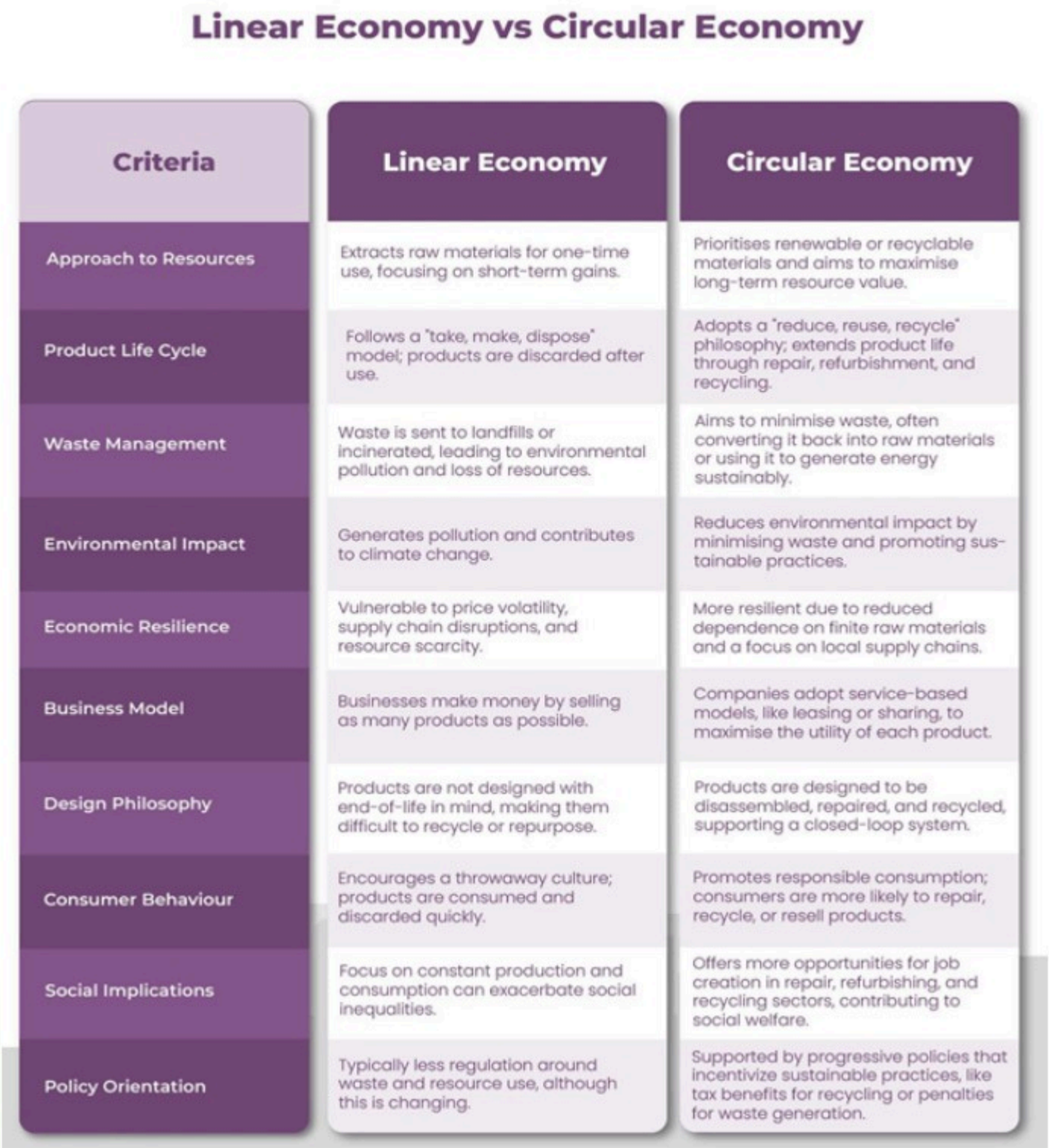
The European Commission has also adopted a new Circular economy action plan, which also serves as a prerequisite to achieve the EU's 2050 climate neutrality target and to halt biodiversity loss. Essentially the differences lay in all parts of both concepts. The linear economy primarily focuses on profit and all of its processes are driven by it. Circular economy on the other hand requires designing products being durable and producing minimal waste

Fig. 1 Linear, Recycling and Circular Economy

Source: DXC Technology, 2025.

While the linear economy uses as much raw materials as needed, the circular one transforms the mechanisms of production to rely on renewable energy, reuse of materials and limitation of waste. While the linear economy encourages customers to buy more products and dispose of waste, the circular economy produces products that are refillable, repairable and reusable. Furthermore, the linear economy focuses on production of products, while the circular economy tries to shift the focus to services by expanding the concept of renting different products that you need to use.

Fig. 2 Linear vs Circular Economy



Source: Conquest Creatives, 2025.

Principles of the Circular Economy

1. Energy and resource efficiency - the use of non-renewable resources is minimized. Reusing materials is essential for the circular economy concept,minimizing dependence on constant consumption of raw materials.

2. Sustainability - the circular economy also focuses on increasing the usage of renewable sources of energy (like sun, water and wind power). This decreases the harmful emissions and aims to preserve the healthy state of the planet and its ecosystems.

3. Product design - the products are designed to have longevity, reusability and to be easily repaired. These principles are rooted in the product design that follows the circular economy concept. This ensures that the resources are going to have a long life and will not be thrown away right after use.

4. Innovation - the growing number of businesses that transition from linear to circular economy philosophy create a field for new technologies, approaches and all

other kinds of innovation. The concept of a circular economy itself encourages the competitiveness of the companies which will make products become more and more sustainable, reusable and durable.

5. Service not product - one way the circular economy deals with overconsumption and overproduction is with shifting the focus from product to service. Instead of manufacturing many products companies add to their services the opportunity for the clients to rent the tools and resources they need.

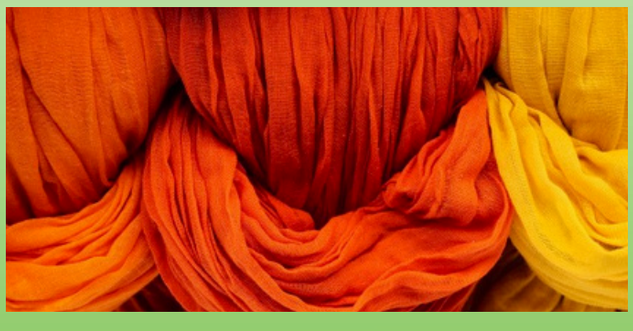
Transitioning to a circular economy is not only physically transforming the manufacturing processes, but also shifting our way of thinking and perspective. Instead of thinking of how to consume and own more things, we start to think about how we can keep the things we already possess in use and in good shape. This gives us the possibility to explore different ways of repurposing and of maintenance while creating different communities where people can explore together. We are going to introduce different community ways to practice circular economy in the tenth chapter.

Main areas related to the Circular Economy

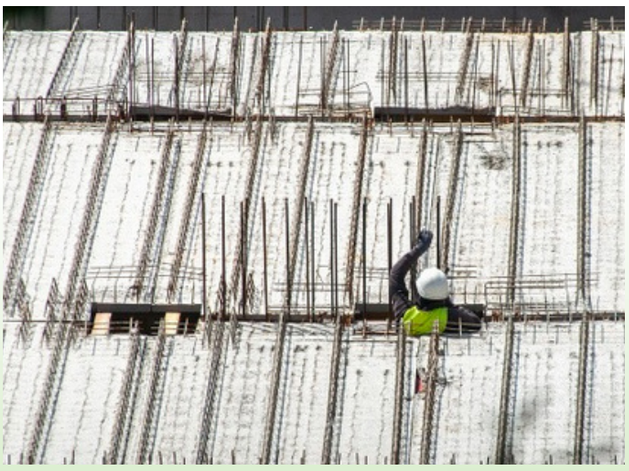
"The transition to a circular economy entails transformative changes in all economic sectors." says the Circular city funding guide. Exploring this resource and the following chapters of this Curriculum we can mention some of the sectors.

1. Manufacturing - this process is associated with an increased demand for depleting resources, high volumes of waste, and polluting emissions. Incorporation of circular economy methods in this field can decrease the need for raw resources, the waste and emissions, and can even lead to economic benefits due to cost reduction and job creation.

2. Mobility, based on circular economy principles means that transport becomes cleaner, more flexible and shared. This can lower emissions from different vehicles and can transform the infrastructure to serve different purposes like more green spaces and playgrounds. We are going to dive into this topic in the sixth chapter.



3. Textiles - the whole textile industry is very concerning when speaking of sustainability and ecological impact. Many materials are used in the process and a really small part of them is recycled or repurposed, when almost all of the rest ends up in landfills. Circular economy approaches to fashion can reduce waste through repurposing,



repairing and recycling materials, stimulating companies to use renewable energy sources in the process. This topic will be widely covered in the eighth chapter.

4. Waste management and material recycling - the regional and national governments can play a key role in creating and communicating strategies to reduce waste. This can happen through initiatives of recycling and repurposing materials, minimizing the need for constant extraction of raw materials. This topic is expanded in the fourth chapter.

5. Food and water consumption - the manufacturing process demands a big amount of clean water and energy, while wastewater treatment processes still fail to recover valuable nutrients. In addition, the food production and consumption uses many finite resources while also producing waste and depleting the soil. More circular approaches in this field will lead to less water use and pollution while reducing the food production levels to just what is required, thus protecting the environment in the process. This topic will be widely covered in chapter seven.

6. Construction - the negative consequences in the linear approach to this sector can be decreased by shifting to more circular methods. This means transforming the way we design, build and maintain buildings and roads, which in turn leads to more efficient use of spaces and materials. You can explore more about this topic in chapter nine.

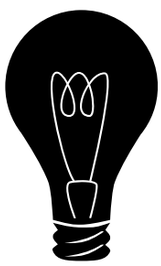
Best practice or real case scenarios

In Germany we can see the Woodscraper project as an example of circular economy based construction. The aim is to build a residential building with a more circular approach. The building is designed to be constructed mainly from wood and straw (except for the staircases, which are built from concrete). (You can explore the document Circular economy in practice: Case studies & exercises for trainers in construction to find out more interesting projects like the Woodscraper). We can also see the sports equipment company Decathlon as a great example for shifting the focus to circular economy methods. Anna Turrell, Decathlon's chief sustainability officer, was in charge of the transition. The company incorporated some efficient ways of maintaining the equipment like adding in-store repair shops, where everyone can bring their sports equipment and take care of it.

Fig. 3 Woodscraper

Source: Partner und Partner, 2019.

They also introduced the buy-back offer, which is that you can bring your old equipment and in exchange receive a voucher (or in some places even money). After this the equipment is given for rent as with other equipment from the stores. All these practices, incorporated in the company, try to encourage people to reduce the consumption and the unnecessary material waste.



Summary and Key Implications

In summary there are some methods and concepts of the two economy types - linear and circular - that can be perceived as identical or similar, but the key principles are very different and are aiming for different things. The traditional economy we know is called “linear” because of the structure of its mechanisms. Before the use of the product there are steps, followed consistently as raw materials are transformed into products and distributed to customers. After their lifetime and usability is exhausted they end up as waste. As we see the linear economy follows the “take, make, dispose” approach. On the other hand the circular economy adopts a different approach. Its aim is to minimize the use of raw materials by making the product designs more durable, repairable and recyclable. With that approach the waste remains small, the business owners are encouraged to use renewable energy, the companies foster innovation and the focus shifts from “take, make, dispose” to “reduce, reuse, repair and recycle”. The circular economy is a model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products as long as possible. In this way, the life cycle of products is extended. As main concepts and models of circular economy we can distinguish the Energy and resource efficiency, Sustainability, Product design, Innovation and Product-as-a-Service (PaaS) approach. Circular economy methods can be incorporated in every economic field. In this chapter we mention the fields of Manufacturing, Transportation, Textiles, Waste management and material recycling and Food and water consumption, covered in more detail in the following chapters.

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Youth Workers Corner n°2

Hands-on Tips for Youth Workers

To ensure storytelling is engaging, inclusive, and impactful.

1. Make the Story Relatable and Local
Start from real life:
• Encourage youth to tell stories about items they use every day — a phone, a pair of jeans, a water bottle — and trace its "life journey" (where it came from, how it could be reused or repaired).
Use community examples:
• Highlight local initiatives (recycling centers, repair cafés, thrift stores) as story settings. This makes the abstract "circular economy" concrete and personal.
Invite guest storytellers:
• Bring in local entrepreneurs, artists, or environmental activists who already apply circular practices.

2. Compare Linear vs Circular Economy Through a Visual Story Table
Create a big poster or floor chart with two columns:

Linear (line)	Circular (Circle)
Take -> Make -> Dispose	Reduce -> Reuse -> Repair -> Recycle
Ownership focus	Renting/ sharing focus
Waste as end point	Waste as new beginning

Make it interactive:
• Ask youth to place drawn or real items (bottle, t-shirt, bike, phone) in the column they think they belong in — then discuss how the story of the item can shift from the linear side to the circular one.

3. Host a Friendly Debate: "The Line vs. The Circle"
Set up:
• Split into two groups:
  • One group speaks as the Linear Economy
  • The other speaks as the Circular Economy

Guiding prompts:
• "What do you value?"
• "Who benefits from your way of working?"
• "Where do you struggle?"
Then switch sides — everyone experiences both narrative -> "Find the Holes"
• Linear team must point out weaknesses in circular economy
• Circular team must point out weaknesses in linear economy

Goal:

- Not to “win,” but to understand why change is challenging and where each approach has limitations.

Make it interactive:

- Assign teams, but as characters: Linear economy - “More, faster, cheaper!”, Circular economy - “Keep things in use longer!”.

- Encourage them to be playful, exaggerated, dramatic — this lowers pressure and

Video
Exploring Circular Economy Concepts

STORY MAP

Approaches to Circular Economy Concepts

Characters

Mara and her friend Elias, two enthusiastic young people who love tech and imagine a clean world.

Mayor Steve, the well-meaning but wasteful mayor of their city.

Setting

The futuristic desert city of Solara, known for its high-tech lifestyle but hidden beneath the sand dunes is a growing mountain of electronic waste.

Beginning

Mara and Elias love exploring the old scrapyard outside Solara. One day, they discover mountains of thrown-away gadgets. They realize the city runs on a linear system.

Middle

Mara and Elias think to open a small workshop. They start by applying circular economy approaches. At first, everyone thinks it's "junk." Then, a sandstorm hits Solara and knocks out the city's power. The only working lights? The repaired solar lamps from the shop.

End

Mayor Steve invites Mara and Elias to present their model to the city council. They propose a citywide circular plan. Solara transforms from a city of waste to a city of innovation. The old scrapyard becomes "The Circle District," where waste becomes opportunity.

Problem

Solara's linear "buy and throw away" economy creates a mountain of electronic waste and pollution.

Solution

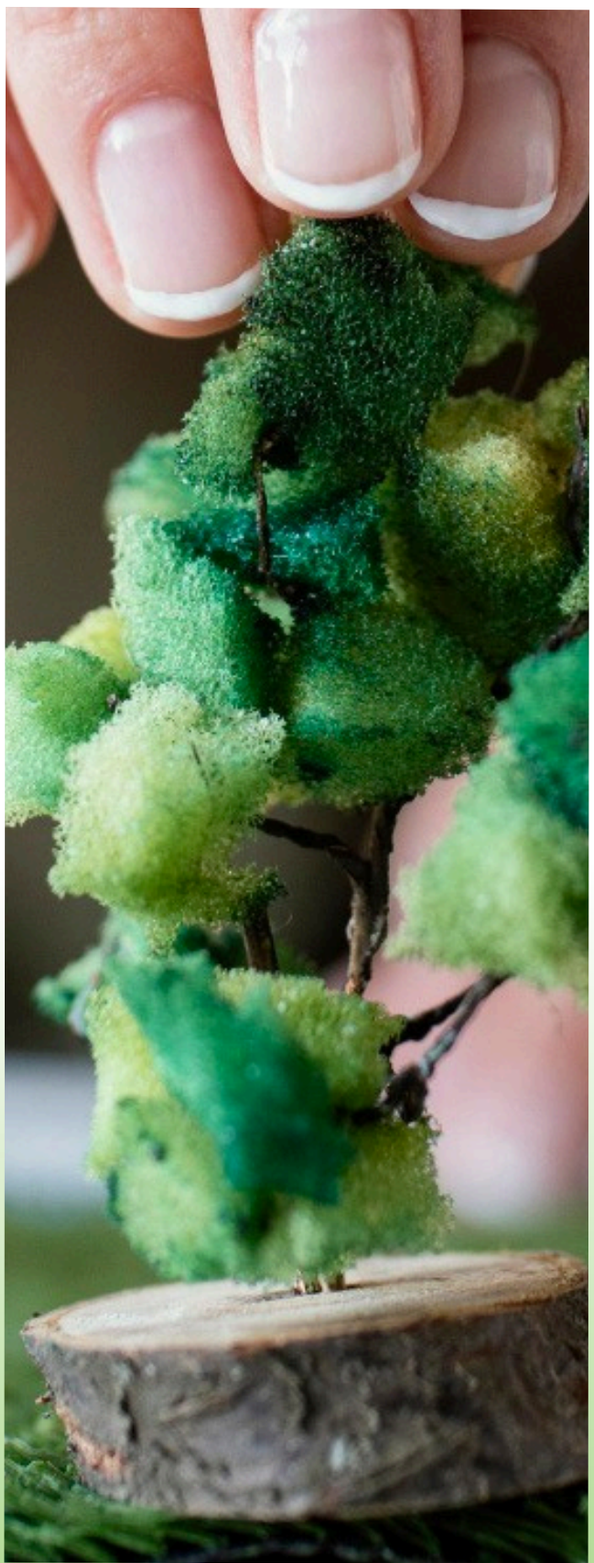
Mara and Elias apply circular economy approaches - repair, remanufacture, reuse, and share - turning waste into resources and inspiring a citywide circular transformation.

Policies and Regulations

EU 2050 Agenda

Introduction

As the global community confronts the environmental and economic challenges of the 21st century, the concept of a circular economy has emerged as a transformative framework for sustainable growth. Unlike the traditional linear model of “take, make, dispose,” the circular economy emphasizes resource efficiency, waste minimization, and the continual reuse of materials. At the heart of this transformation lies the need for coherent and forward-thinking policies—tools that can shape markets, guide innovation, and align economic incentives with environmental objectives. Among the most ambitious policy frameworks globally is the European Union’s Circular Economy Action Plan, an integral part of the broader European Green Deal.



This chapter explores the policyand regulatory landscape that underpins the transition toward a circular economy, with a particular focus on the European Union’s 2050 vision for climate neutrality and sustainable resource use. It examines the key legislative measures, strategic roadmaps, and cross-sectoral initiatives that are shaping the EU’s path forward, including the revised Waste Framework Directive, The Sustainable Products Initiative, and sector-specific strategies in areas such as textiles, electronics, and construction. By analyzing the interplay between regulation, innovation, and market behavior, this chapter aims to provide a critical understanding of how public policy can drive systemic change and enable the circular economy to become the foundation of Europe’s future prosperity.

Policies and regulations

Policies and regulations that promote the circular economy can be broadly classified into five main categories. Each type addresses different parts of the value chain and plays a unique role in enabling circular systems.

Product Design and Eco-innovation Regulations

The goal is to encourage the design of products that are durable, repairable, recyclable, and resource-efficient. These policies set the foundation for circularity by regulating how products are conceived and manufactured. By mandating standards for energy efficiency, modularity, or use of recycled content, they reduce resource use from the start and extend product lifespans. This creates upstream change, pushing innovation toward sustainability across entire industries.

Fig. 1 Circular Economy Process

Source: European Commission, 2020.

1. Waste and Resource Management Policies - The goal is to shift the focus from waste disposal to resource recovery, reuse, and recycling. These regulations redefine waste as a valuable resource. Through legal obligations for separate collection, recycling targets, and landfill bans, they create infrastructure and incentives for circular material flows. EPR schemes also hold producers accountable for end-of-life management, encouraging better product lifecycle planning.

2. Market-Based Instruments - The goal is to align economic incentives with circular practices. Market-based tools correct externalities by making pollution and resource depletion more costly while rewarding circular solutions. Subsidies and green public procurement also support circular businesses in scaling up. This type of policy creates financial motivations. Examples include carbon pricing, virgin material taxes, subsidies for circular business models.

3. Information and Transparency Requirements - The goal is to provide consumers and stakeholders with data to make informed choices and facilitate reuse/recycling.Transparency is crucial in a circular economy. These policies require producers to disclose material composition, environmental impact, and repairability, empowering consumers and recyclers. It also helps regulators track materials and improve waste management efficiency. Examples include Digital Product Passports, labeling schemes, right to repair disclosures.

4. Strategic and Cross-sectoral Frameworks - The goal is to provide an overarching vision, coordinate stakeholders, and ensure policy coherence. These high-level strategies integrate circularity across sectors like construction, food, mobility, and electronics. They foster collaboration across government, industry, and civil society while aligning climate, industrial, and digital policies. This systemic approach ensures that circularity is not siloed but embedded in economic planning.

Principles of Circular Economy Policies and Regulations

1. Prevent Waste and Pollution at the Source - Circular policies should prevent waste generation and pollution before they occur. This principle is reflected in regulations that encourage sustainable product design, cleaner production processes, and bans on certain harmful materials. By addressing issues upstream—during product development and manufacturing—governments can reduce downstream burdens on waste management and the environment.

2. Keep Products and Materials in Use - One of the core goals of circular economy policies is to extend the lifecycle of products and materials through reuse, repair, remanufacturing, and recycling. This principle is embedded in right-to-repair laws, incentives for product-as-a-service models, and extended producer responsibility schemes. These policies aim to shift economies from single-use and short-lived consumption toward long-term value retention.

3. Design for Circularity - Circular regulations promote product and system design that supports circular outcomes. This includes durability, modularity, disassembly, and the use of recyclable or biodegradable materials. Policies like the EU's Ecodesign Directive encourage industries to integrate circular thinking from the earliest stages of development, creating goods that can be easily reused or reintegrated into the economy

4. Internalize Environmental Costs - Market-based instruments like carbon pricing, landfill taxes, and virgin material levies reflect the true environmental cost of resource extraction and pollution. By internalizing these externalities, such policies make circular alternatives more economically viable. This principle ensures that environmental harm is not treated as a "free" consequence of business-as-usual.

5. Promote Systemic and Cross-sectoral Integration - Circularity requires coordinated action across sectors, levels of government, and stakeholders.

Strategic policy frameworks, like national circular economy roadmaps or the EU Circular Economy Action Plan, are designed to integrate efforts across domains—energy, transport, agriculture, industry—ensuring a cohesive and synergistic transition. This principle underscores the need for a systems-thinking approach.

6. Empower Consumers and Ensure Transparency - Regulations increasingly require businesses to provide transparent information about the environmental impact, material composition, and reparability of products. This empowers consumers to make informed choices and drives demand for sustainable goods. Transparency tools like digital product passports and eco-labels reflect this principle in action.

7. Foster Innovation and Capacity Building - To unlock new business models and technologies, circular policies often include support for R&D, skills development, and infrastructure investment. This principle focuses on enabling change rather than just enforcing compliance, recognizing that a successful transition depends on creativity, entrepreneurship, and public-private collaboration.

8. The problem of implementation: China’s Circular Economy Promotion Law - China's Circular Economy Promotion Law (CEPL), enacted in 2008 and effective from January 1, 2009, represents a significant legislative effort to transition the country toward sustainable development. The law defines a circular economy as encompassing activities of reduction, reuse, and recycling across production, circulation, and consumption processes. To support these initiatives, the law establishes a framework for government incentives, including fiscal funds, tax preferences, and banking loan support, to promote recycling and resource efficiency. The implementation of CEPL has encountered several significant challenges since its enactment. A primary issue is the law's broad and somewhat vague definition of a circular economy, which lacks clear boundaries and measurable targets. Enforcement of the CEPL is further complicated by the decentralized nature of China's governance. Local governments, often prioritizing economic growth and employment, may be reluctant to enforce environmental regulations that could hinder

industrial activity. Finally, financial and technological constraints also impede the law's implementation. Small and medium-sized enterprises (SMEs), which constitute a significant portion of China's industrial sector, often lack the capital and technical expertise to adopt circular economy practices.

The EU 2050 Agenda and the Circular Economy

The EU 2050 Agenda is the European Union's long-term strategic vision for a climate-neutral, sustainable, and competitive economy by the year 2050. The cornerstone of this vision is the European Green Deal, launched in 2019, which aims to make Europe the world's first climate-neutral continent. The development and adoption of the EU's 2050 climate neutrality agenda involved coordinated efforts among the European Commission, the Council of the European Union, and the European Parliament. Until 2019, the EU followed a 'silo approach' in the policy areas of climate change, biodiversity and circular economy, which did not reflect the actual interlinkages between these different domains. In contrast, the European Green Deal has been shaped as an integrated growth strategy, which aims at transforming the EU into a climate neutral and resource efficient economy, while protecting, conserving and enhancing the EU's natural capital. The Green Deal and more generally the 2050 agenda sets out a comprehensive roadmap to:

- Achieve net-zero greenhouse gas emissions by 2050
- Decouple economic growth from resource use
- Protect biodiversity and restore ecosystems
- Promote fairness and inclusion during the green transition

To reach these goals, the EU is transforming its energy, transport, agriculture, and industrial systems. The circular economy is a central pillar of the EU 2050 agenda. It's seen as essential to achieving climate neutrality, preserving natural resources, and enhancing economic resilience. Through policies like the Circular Economy Action Plan (2020) and updates to the Ecodesign Directive, Waste Framework Directive, and Sustainable Products Initiative, the EU is embedding circularity across sectors—from electronics and textiles to construction and packaging. By transitioning to a circular economy, the EU aims not just to cut emissions, but to build a regenerative economy that creates jobs, reduces dependency on raw material imports, and aligns with the broader goals of the Green Deal.

Fig. 1 Circular Economy Process

Source: European Commission, 2020.

Below are the main initiatives:

1. Circular Economy Action Plan (CEAP) - Adopted in March 2020, the CEAP is central to achieving the EU's 2050 climate neutrality target. It introduces measures across the entire product lifecycle, focusing on design, production processes, consumption, and waste management. Key objectives include:

- Making sustainable products the norm in the EU.
- Empowering consumers and public buyers for sustainable choices.
- Targeting sectors with high resource use and circularity potential (e.g., electronics, textiles, packaging, construction).
- Reducing waste generation and promoting resource efficiency.

2. Key Legislative Packages - The EU has introduced several legislative packages to accelerate this transition:

- Eco-design Rules Expansion: Proposed in March 2022 to ensure products are durable, repairable, and recyclable.

- Sustainable Textiles Strategy: Aims for textiles placed on the market by 2030 to be long-lasting, recyclable, made of recycled fibers, and free from hazardous substances.
- Packaging Rules Revision: Approved in April 2024 to reduce packaging waste and improve recycling rates.
- Waste Framework Directive Revision: Focused on managing textile and food waste sustainably (July 2023).
- Carbon Removals Certification: Introduced EU-wide certification for carbon removals in April 2024 to ensure accurate measurement and long-term storage.

3. Sector-Specific Circularity Initiatives - The EU has targeted specific sectors critical for circularity:

- Plastics: Phasing out microplastics and supporting recycling through the European Strategy for Plastics.
- Electronics & ICT: Promoting product reusability and reparability to address growing e-waste.
- Food & Nutrients: Halving food waste by 2030 under the Farm-to-Fork Strategy.
- Batteries & Vehicles: Enforcing low-carbon production standards for batteries and ensuring ethical sourcing of materials.
- Construction & Buildings: Setting targets for carbon footprint reduction in building materials and improving energy efficiency regulations (updated in March 2024).
- Persistent Organic Pollutants (POPs) Regulation
- In October 2022, stricter limits were introduced on dangerous chemicals in waste and production processes to reduce pollutants entering recycling streams.

4. Global Leadership in Circular Economy - The EU aims to lead global efforts by promoting circular economy principles internationally while fostering regional collaboratin within Europe. It seeks to create resilient value chains and reduce dependency on finite resources globally. These initiatives collectively aim to decouple economic growth from resource exploitation, minimize environmental impact, create sustainable jobs, and ensure a healthier planet by 2050. However, a recurring limitation in EU regulations, is «the lack of consideration for the unique characteristics of individual Member States when establishing common targets. Nevertheless, it seems that there is a certain degree of convergence between EU member states.

Role of Young Consumers and Youth Engagement in Circular Economy Policies

Young consumers are playing an increasingly pivotal role in shaping the transition toward a circular economy. As a generation that is both highly informed and deeply concerned about climate change, biodiversity loss, and social equity, youth are driving demand for sustainable products, ethical supply chains, and transparent business practices. Their consumption choices—favoring second-hand goods, zero-waste lifestyles, and circular services like renting or repairing—are influencing market trends and pushing businesses to adapt. In this way, young consumers act as both catalysts for behavioral change and key participants in the cultural shift required for circularity to take root. Beyond consumption, youth engagement is critical in the development and implementation of circular economy policies. Young people are increasingly active in environmental advocacy, community initiatives, and entrepreneurship that promote circular practices. Their involvement brings fresh perspectives, creativity, and digital fluency—traits that are essential for reimagining linear systems and designing innovative solutions. Youth- led organizations, student movements, and digital influencers have successfully raised awareness about issues like fast fashion waste and electronic obsolescence, thereby amplifying public pressure on governments and corporations to take action.

Recognizing this potential, many policy frameworks—particularly within the European Union—are beginning to incorporate youth voices more directly. Initiatives such as the EU Youth Dialogue, the European Climate Pact, and targeted funding under Horizon Europe and Erasmus+ create opportunities for young people to contribute to policy design, participate in green innovation projects, and build skills for the circular economy. Education policies are also evolving to include sustainability and circular economy principles in curricula, ensuring that the next generation is not only aware of these challenges but equipped to address them.

Thus, youth are not merely passive beneficiaries of circular economy policies—they are essential agents of change. By empowering young consumers and actively engaging youth in decision-making processes, policymakers can build stronger, more inclusive, and more resilient pathways to a circular future. Their energy, innovation, and commitment will be crucial in achieving long-term goals such as the EU's vision for a climate-neutral, resource-efficient economy by 2050.

Young people can support the EU circular economy goals in a variety of ways:

1. Make Conscious Consumption Choices:
   - Prioritize buying second-hand, repairable, and eco-designed products. Support companies that follow ethical and circular practices—look for certifications or transparency labels.
   - Reduce single-use items and embrace reuse, repair, and sharing models (e.g., clothes swaps, tool libraries, refill stations).
2. Embrace and Promote Circular Lifestyles:
   - Advocate for zero-waste living, composting, and DIY repairs. Use social media and creative platforms to raise awareness about the environmental impacts of fast fashion, e-waste, and overconsumption.
   - Inspire peers by sharing sustainable practices, tips, and local initiatives.
3. Support and Launch Circular Startups or Projects:
   - Get involved in youth-led entrepreneurship focused on repair, upcycling, product-as-a-service, or circular design.
   - Join or create university groups, co-ops, or NGOs working on local circular economy solutions.
   - Apply for EU funding (e.g., Erasmus+ Youth Entrepreneurship, EU Youth Start-Up Competitions).
4. Learn and Share Knowledge:
   - Educate yourself through EU platforms like the European Circular Economy Stakeholder Platform (ECESP) or GreenComp (EU sustainability competence framework).

- Organize or attend local workshops, clean-up campaigns, repair cafés, or sustainability hackathons.
- Encourage your school or university to adopt circularity in their curriculum and operations.

Engage more with EU policies

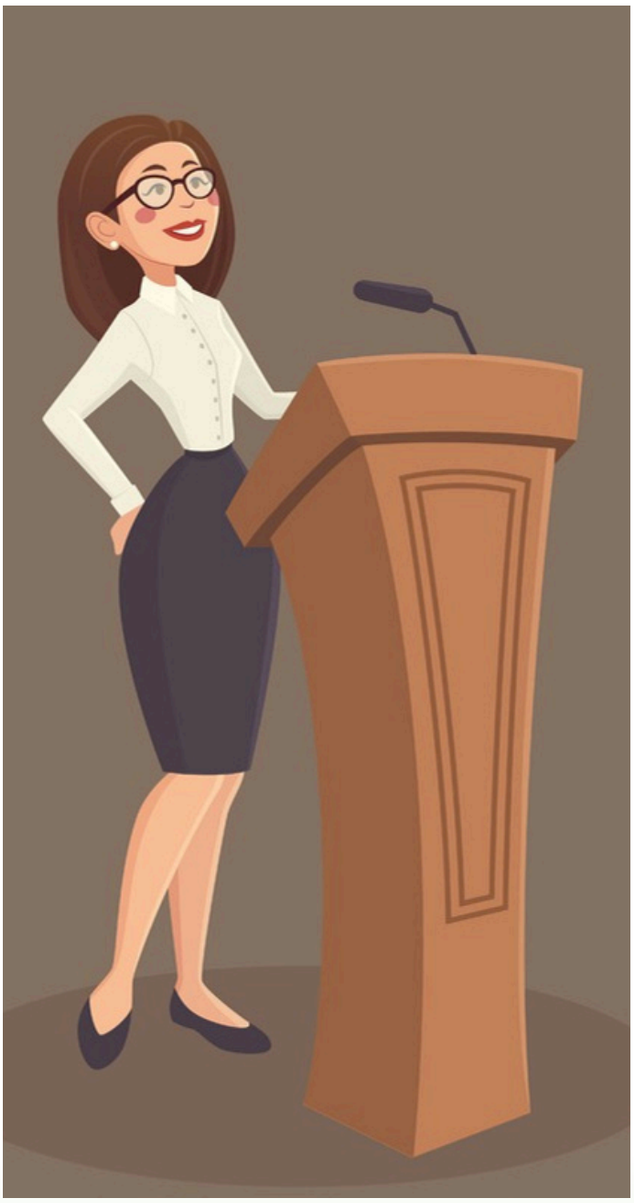
Young people can participate in EU Youth Dialogues and Consultations. They can join the EU Youth Dialogue, a platform that lets young people shape EU youth policies through structured conversations with policymakers and take part in public consultations on EU legislation through the Have Your Say portal. They can also join youth networks and environmental movements and get involved with groups like Generation Climate Europe, Youth and Environment Europe (YEE), or the European Youth Forum—many of which advocate for climate and circular economy policies. And they can also join or even start campaigns focused on climate justice, circular economy, or green education reform.

Fig. 3 EU Youth Consultations

Source: European Youth Portal, 2025.

Young people are not just future leaders they're present changemakers. By combining sustainable living with active participation in democratic processes, youth can accelerate the circular transition and make sure it's inclusive, ambitious, and innovative.

Events and initiatives on Circular Economy



Here are several notable events and initiatives at both national and European levels that promote the circular economy:

1. EU Circular Talks - European Circular Economy Stakeholder Platform - ECESP):

- Where: Online & Brussels-based
- When: Ongoing series with major gatherings yearly, especially around spring/autumn
- Why it matters: These stakeholder dialogues often feature youth voices, entrepreneurs, and students engaging with policymakers and business leaders to shape the future of the EU Circular Economy Action Plan

2. European Youth Event (EYE):

- Where: European Parliament, Strasbourg
- When: Every two years (next edition 2025, with smaller EYE events in between)
- Why it matters: Brings together thousands of young Europeans to discuss issues like climate, sustainability, and circularity. Includes workshops, talks, and direct input into EU policymaking through the EYE Report.

3. Circular Economy Hotspot Europe:

- Where: Rotates annually among EU countries (e.g., Dublin 2023, Bilbao 2024)
- When: Annually, usually in autumn
- Why it matters: A high-level event with strong participation from startups, students, and local youth organizations. Highlights real-world circular projects and includes site visits, exhibitions, and innovation showcases.

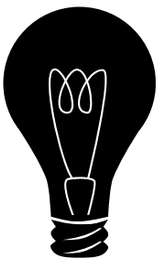
4. Climathon (by EIT Climate-KIC):

- Where: Across many European cities
- When: Annually in October
- Why it matters: A hackathon-style event where young people co-create solutions to local climate and circular economy challenges. Many winning ideas are further incubated and supported through EU innovation programs.

5. EIT Circular Economy Prize Events / EIT Jumpstarter:

- Where: Multiple EU locations (including online rounds)
- When: Annually (prize ceremonies typically in Q4)
- Why it matters: Targets students, researchers, and young entrepreneurs, helping them turn circular economy ideas into viable startups. Run by EIT RawMaterials, part of the EU's innovation arm.

6. Youth Climate Summit (Various national versions):
   - Where: Varies by country (e.g., Germany, France, Italy, Netherlands)
   - When: Usually in spring or fall
   - Why it matters: While broader than just circularity, these summits often include circular economy panels, policy simulations, and innovation labs. Some directly feed into national positions on EU climate policy.
7. Green Week (EU Green Week):
   - Where: Brussels + satellite events across Europe
   - When: Every June
   - Why it matters: The EU's flagship environmental event-each year has a different theme (often touching on circularity, zero pollution, or sustainable consumption). Increasing focus on young changemakers, with youth panels and challenges.



Summary and Key Implications

In conclusion, the regulations and policies surrounding the circular economy have gained significant traction in recent years, especially in the context of the European Union's 2050 agenda for a sustainable, climate-neutral future. The EU has introduced a series of legislative frameworks, including the Circular Economy Action Plan, aimed at reducing waste, promoting recycling, and fostering the reuse of materials. These policies are designed to transition the EU towards a more sustainable economic model, emphasizing eco-design, waste reduction, and the use of renewable resources. With ambitious targets set for 2030 and 2050, the EU is shaping the future of circularity by integrating sustainability into all sectors of the economy, including manufacturing, agriculture, and energy. The EU's 2050 agenda not only emphasizes the need for robust regulations but also recognizes the importance of collaboration at all levels, including with the private sector, governments, and citizens. The circular economy is seen as a crucial component in achieving the EU's Green Deal, contributing to a reduction in greenhouse gas emissions, resource dependency, and environmental degradation. To meet these targets, it is essential for industries to adopt sustainable practices, which will require clear and coherent policies from the EU to drive innovation and implementation of circular models. This regulatory approach is vital to enabling the circular economy to thrive, but it must be paired with effective enforcement and incentives that ensure compliance across member states. Youth engagement plays a pivotal role in the successful realization of the EU's circular economy goals. Young people are not only the future generation but also the innovators and change-makers who can drive the transformation towards a more sustainable society. By raising awareness, influencing policy, and adopting sustainable practices in their daily lives, youth can act as catalysts for the circular economy. Their advocacy and participation are crucial in ensuring that the EU's sustainability goals are achieved and maintained. With increased education on sustainability, coupled with opportunities for youth to engage in policy-making and innovation, the role of young people in shaping the future of the circular economy is essential to meeting the EU's 2050 climate and sustainability targets.

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Youth Workers Corner n°3

Workshop n°1 Theme: Designing Our Circular Future

Theme:

- Sustainable product design and circular innovation inspired by EU circular economy policies.
-

Purpose and Objective of the Workshop:

- To help youth workers and young participants understand the concept of circular economy and its policy background (EU 2050 Agenda, Circular Economy Action Plan).
- To foster creativity and innovation through designing sustainable, circular products or services.
- To encourage teamwork, systems thinking, and awareness of eco-design principles.

Target Group and Optimal Group Size:

- Youth workers and young people (16–30 years old).
- Optimal group size: 12–25 participants (divided into small teams of 3–5).

Timing	Activity Phase	Description
15 min	Introduction	Brief presentation on circular economy, EU initiatives (Ecodesign Directive, Waste Framework Directive), examples like Repair Café. Discuss circular vs linear model.
20 min	Group Brainstorm	Teams choose one product, map its linear lifecycle, identify waste and inefficiencies.
40 min	Circular Redesign Challenge	Teams redesign the product using circular principles (durability, repairability, modularity), create concept posters.
25 min	Presentation and Feedback	Teams present designs linking to policy principles; group Q&A and feedback.
20 min	Wrap-up Discussion	Facilitator links outcomes to EU circular goals and youth roles in innovation.

Materials: Flipcharts, markers, sticky notes, A3 paper, projector, example objects
Duration: 2 hours

Proposed Workshop Procedure and Methods Used:
Introduction (15 min):

- Brief presentation on the circular economy, key EU initiatives (Ecodesign Directive, Waste Framework Directive, Sustainable Products Initiative), and examples like the "Repair Café" and "Precious Plastic."
- Discuss how circularity differs from the linear "take–make–dispose" model.

Group Brainstorm (20 min):

- Teams choose one product (e.g., a phone, t-shirt, or bottle) and map its linear lifecycle.
- Identify where waste, pollution, or inefficiencies occur.

Circular Redesign Challenge (40 min):

- Teams redesign the chosen product or service using circular principles: durability, repairability, modularity, recyclability, and minimal waste.
- Each team sketches a concept poster showing the product's circular flow.

Presentation and Feedback (25 min):

- Teams present their design and how it addresses policy principles (eco-design, transparency, consumer empowerment).
- Group Q&A and constructive feedback.

Wrap-up Discussion (20 min):

- Facilitator links workshop outcomes to EU policy goals and youth's role in driving innovation and sustainable consumption.

Required Materials and Estimated Duration:

- Flipcharts or whiteboards, markers, sticky notes, A3 paper, digital projector, and example objects.

Final Discussion and Feedback:

- What did participants learn about circular design?
- How can youth workers promote similar innovation challenges in schools or communities?

Reflection: "How can our daily consumption choices support EU circular goals?"

Workshop n°2 Theme: Youth Voices for Circular Change

Theme:

- Youth participation and advocacy in shaping circular economy policies.

Purpose and Objective of the Workshop:

- To empower youth workers and young participants to understand how EU circular economy policies are made and where young people can influence them.
- To simulate democratic engagement through role-play and policy dialogue.
- To develop advocacy and communication skills relevant to sustainability policy.

Target Group and Optimal Group Size:
Youth workers, youth leaders, and active young citizens (18–35 years old).
Optimal group size: 15–30 participants.

Timing	Activity Phase	Description
10 min	Icebreaker "Who Represents Me?"	Reflect on how policies affect daily life (waste sorting, eco-labels, fast fashion).
15 min	Mini Lecture	Input on EU Circular Economy Action Plan, Green Deal, Youth Dialogue; examples like Generation Climate Europe.
45 min	Role-Play Circular Policy Simulation	Participants in roles (policymakers, activists, industry, NGOs, media) debate and negotiate amendments in EU hearing simulation.
30 min	Debriefing and Reflection	Discuss policymaking challenges, compromises, youth influence in consultations.
20 min	Action Planning	Small groups draft local youth initiatives for circularity (swap events, entrepreneurship clubs).

Materials: Role cards, EU policy handouts, markers, flipcharts, projector
Duration: 2 hours

Proposed Workshop Procedure and Methods Used:

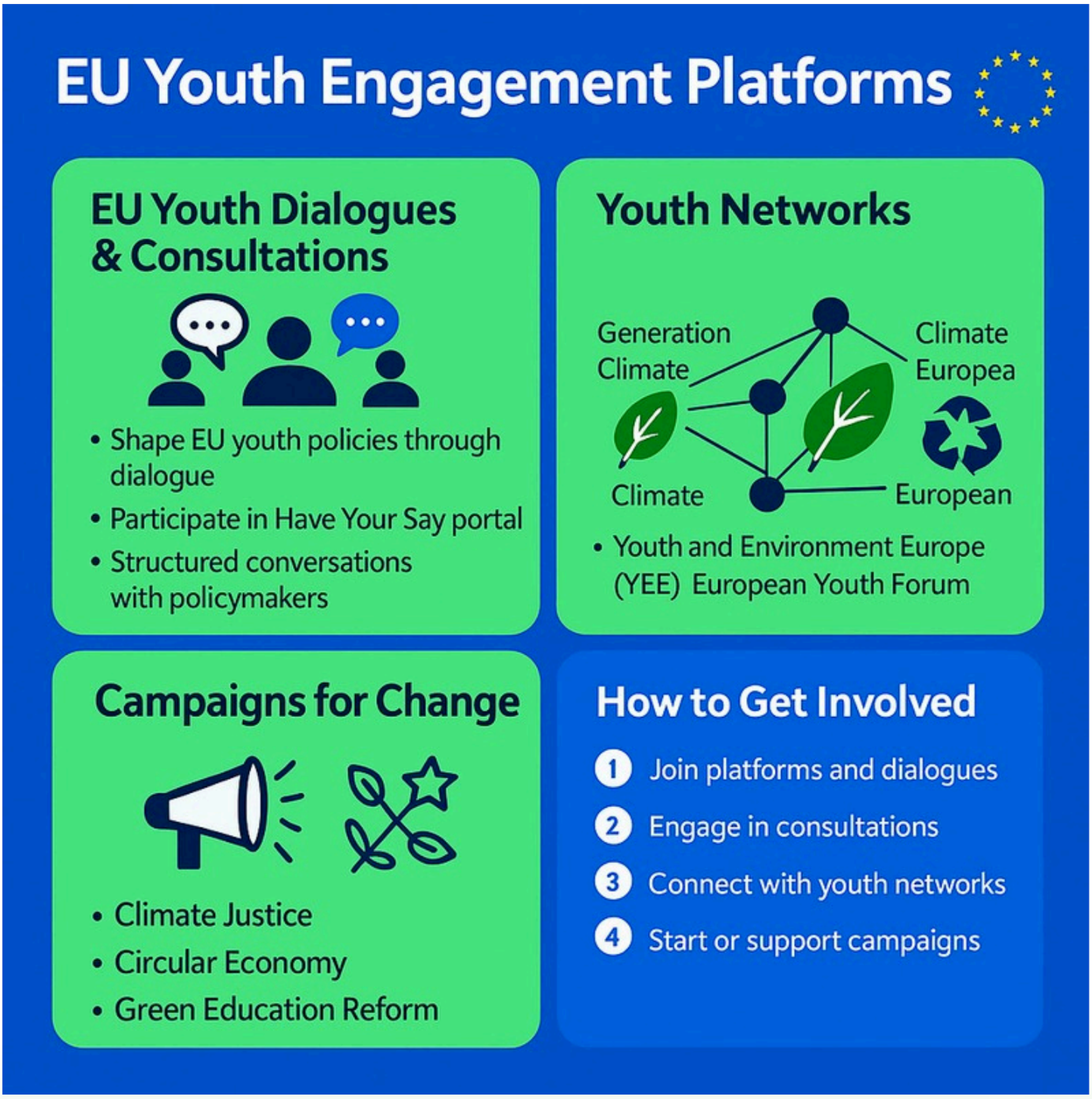
- Icebreaker: "Who Represents Me?" (10 min):

Participants reflect on how policies affect their daily life (e.g., waste sorting, eco-labels, fast fashion).

- Mini Lecture (15 min):
  - Short input on EU's Circular Economy Action Plan, Green Deal, and Youth Dialogue mechanisms.
  - Present real examples like "Generation Climate Europe" and the "European Climate Pact."
- Role-Play: Circular Policy Simulation (45 min):
  - Divide participants into roles: policymakers (EU Commission), youth activists, industry representatives, NGOs, and media.
- Scenario: EU debating stricter repairability laws for electronics.
  - Each group prepares arguments and proposed amendments.
  - Conduct a simulated EU hearing with negotiations and final proposals.
- Debriefing and Reflection (30 min):
  - Discuss challenges of policymaking, compromise, and representation.
  - Reflect on how youth can influence real-life EU consultations (e.g., "Have Your Say" platform, EU Youth Dialogue).
- Action Planning (20 min):
  - In small groups, draft a local youth initiative idea to support circularity (e.g., local "swap and share" event or circular entrepreneurship club).

- Required Materials and Estimated Duration:
  - Role cards, EU policy summaries (handouts), markers, flipcharts, and projector.

- Final Discussion and Feedback:
  - How did the simulation reflect real EU policymaking?
  - What barriers or opportunities exist for youth engagement in circular policy
  - Participants share one personal action or project idea they will pursue.



Podcast
EU Policies and Circular Economy

Video
Youth and Circular Economy

EU Circular Economy: Key Sector Targets

Plastics

Phasing out microplastics
Supporting recycling
European Strategy for Plastics

Electronics & ICT

Product reusability & reparability
Combat growing e-waste

Food & Nutrients

Halve food waste by 2030
Farm-to-Fork Strategy

Batteries & Vehicles

Low-carbon battery production
Ethical sourcing of materials

Construction & Buildings

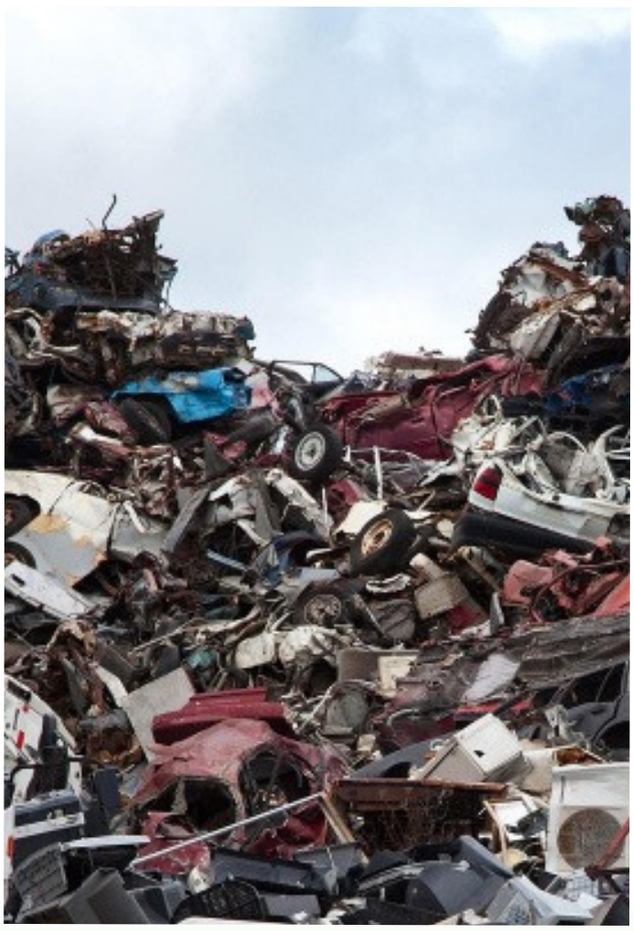
Reduce carbon footprint of materials
Improve energy efficiency regulations
(updated March 2024)

Chemicals & Pollutants

Persistent Organic Pollutants (POPs)
Stricter limits since Oct 2022 on dangerous chemicals in protect recycling streams

Waste Management and Recycling

Introduction



Waste management and recycling are fundamental to building a sustainable future. With urbanization, industrialization, and population growth accelerating, the production of waste has reached unprecedented levels. From plastic pollution clogging oceans to the global crisis of food waste and illegal dumping, the consequences are alarming. Waste management encompasses the collection, treatment, and disposal of waste materials, aiming to minimize environmental and health risks. Recycling, as a subset, focuses on converting waste into new, useful products, conserving natural resources and energy.

This chapter examines these essential practices, categorizes different waste types, explores innovative waste management methods, highlights best practices, and emphasizes the role of youth and youth workers in driving sustainable solutions.

Categories and types of waste

Waste refers to any material, substance, or by-product that is discarded after primary use or deemed no longer valuable. However, not all waste is inevitable; much of it results from inefficient systems of production and consumption. Waste manifests in myriad forms: microplastics infiltrating food chains and causing harm to marine ecosystems, hazardous waste contaminating soil and groundwater, and the phenomenon of planned obsolescence resulting in mountains of electronic waste. Recognizing the true scope and impact of waste is the first step toward crafting effective management strategies.

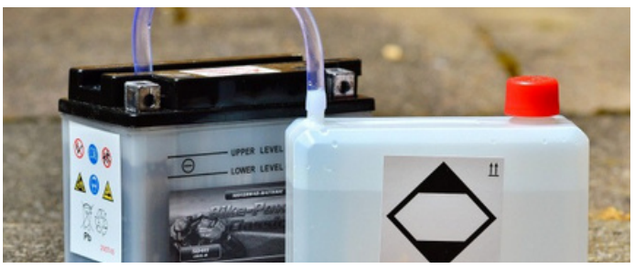
Categories of Waste

Understanding waste categories enables tailored management solutions:

- Household Waste: Generated by residential activities, household waste includes food scraps, plastic packaging, paper products, electronics, textiles, and furniture. Mismanagement leads to overfilled landfills and increased greenhouse gas emissions.

- Industrial Waste: Produced by factories and industrial processes, this category includes chemical residues, scrap metals, and manufacturing by-products. It often requires specialized disposal and regulatory oversight to prevent contamination.

- Bio-waste: Comprising organic materials like food leftovers and garden trimmings, bio-waste is a valuable resource for composting and biogas production, reducing landfill pressure.



- Hazardous Waste: Highly toxic, reactive, or flammable substances such as pesticides, solvents, batteries, and medical waste. Strict handling and disposal measures are critical to avoid serious environmental and health hazards.

Types of Recyclable Waste

Efficient recycling systems depend on the separation and processing of specific material streams:

- Plastics: Sorted by resin types (e.g., PET, HDPE), plastics are shredded, cleaned, melted, and remolded into products like clothing fibers or construction materials. However, not all plastics are easily recyclable.

- Metals: Aluminum and steel can be recycled indefinitely without quality loss. Recycling aluminum, for instance, uses 95% less energy than producing new metal from ore.

- Glass: Recycled glass reduces raw material use and energy consumption. It can be crushed into cullet and reformed into bottles or construction aggregates.

- Paper: De-inked and pulped, recycled paper saves trees, water, and reduces emissions. However, fiber degradation limits the number of recycling cycles.

- Organic Materials: Composting transforms kitchen and garden waste into nutrient-rich soil amendments, supporting sustainable agriculture and reducing methane emissions from landfills.

Importance of Waste Management

Environmental Protection and Public Health - Improper waste management exacerbates air, water, and soil pollution. Leachate from landfills can contaminate groundwater, while burning waste releases harmful dioxins into the air. Urban areas with uncollected waste face heightened disease transmission risks, including outbreaks of cholera, dengue, and respiratory illnesses. Effective waste management ensures a cleaner environment, safeguards ecosystems, and promotes healthier communities. Resource Conservation and Climate Change Mitigation Recycling conserves.

Resource Conservation and Climate Change Mitigation Recycling conserves natural resources and reduces the carbon footprint associated with raw material extraction and processing. For example, recycling one ton of paper saves approximately 17 trees and reduces energy usage by 64%. Moreover, waste-to-energy technologies capture energy from waste materials, decreasing reliance on fossil fuels and mitigating greenhouse gas emissions

Principles of Waste Management

Waste management is based on the following principles:

- Reduce: Designing products for longevity and encouraging mindful consumption helps prevent waste generation. For example, using refillable water bottles reduces plastic waste.
- Reuse: Items like glass jars, clothing, and electronics can be repaired, refurbished, and repurposed, extending their lifecycle.
- Recycle: Transforming waste materials into raw inputs for new products closes the material loop, decreasing the demand for virgin resources.
- Upcycle: Creative repurposing, such as turning old denim jeans into backpacks, adds value to waste and fosters innovation.

Waste Management Systems

1. Collection - Reliable and efficient collection services are vital. Separate bins for recyclables, organics, and general waste encourage household participation and improve material recovery rates.

2. Sorting - Material recovery facilities use a combination of manual labor, mechanical separation, and advanced optical sorting technologies to segregate waste streams effectively. Proper sorting at the source and at facilities enhances recycling efficiency and material quality

3. Final Disposal - Modern landfills are engineered with liners, gas collection systems, and leachate management to minimize environmental impacts. However, minimizing reliance on landfills remains crucial. Composting organic waste and incinerating non- recyclables for energy recovery provide more sustainable alternatives.

4. Innovations in Waste Management - Smart technologies are revolutionizing waste management. IoT-enabled bins optimize collection routes, reducing fuel consumption and emissions. AI-driven robots at recycling centers achieve higher material purity rates, while research into biodegradable plastics and closed-loop recycling systems continues to advance sustainable solutions.

Best Practices and Real Case Scenarios

A number of case studies demonstrate how governments, communities, businesses, and individuals can contribute meaningfully to the principles of a circular economy, turning theoretical models into impactful action.

1. Ljubljana's Zero-Waste Initiative - Ljubljana is the first European capital to adopt a zero-waste strategy. Through comprehensive sorting systems, citizen awareness campaigns, and investments in recycling infrastructure, the city achieved a recycling rate above 68% and drastically reduced its landfill dependency. Key initiatives included door-to-door waste collection systems, extensive use of separate bins, and educational outreach in schools and communities, creating a culture of environmental responsibility. Furthermore, Ljubljana actively involves its citizens in participatory budgeting, allowing them to propose and fund local environmental projects, thus deepening civic engagement with sustainability goals.

Fig. 1: Community recycling bins in Ljubljana supporting the city's zero-waste goal.

Source: Alamy (Public domain).

2. San Francisco's Composting and Upcycling Workshops - San Francisco is widely recognized for its pioneering composting program and community-driven upcycling initiatives. In 2009, it became the first major U.S. city to mandate composting for residents and businesses. The city's "Fantastic Three" program provides separate bins for recycling, composting, and landfill waste, achieving high participation rates. In addition to composting, San Francisco encourages upcycling through local organizations and "Fix-It Clinics," where residents bring broken household items to be repaired by volunteers rather than discarded. The combination of policy, infrastructure, and community engagement has helped San Francisco divert more than 80% of its waste from landfills, setting a benchmark for other cities worldwide.Upcycling workshops in the city often focus on creative reuse— transforming old textiles, wood, and electronics into functional and artistic products. Initiatives like SCRAP (Scroungers' Center for Reusable Art Parts) collect and redistribute reusable materials to artists, educators, and the public, promoting a culture of reuse and creative sustainability

3. Germany's Recycling Centers and Facilities - Germany is internationally recognized for its efficient and effective recycling system, often cited as a global best practice. Through its "Green Dot" system, manufacturers pay a fee based on the recyclability of their product packaging. This incentivizes companies to design sustainable packaging and supports the national recycling infrastructure.

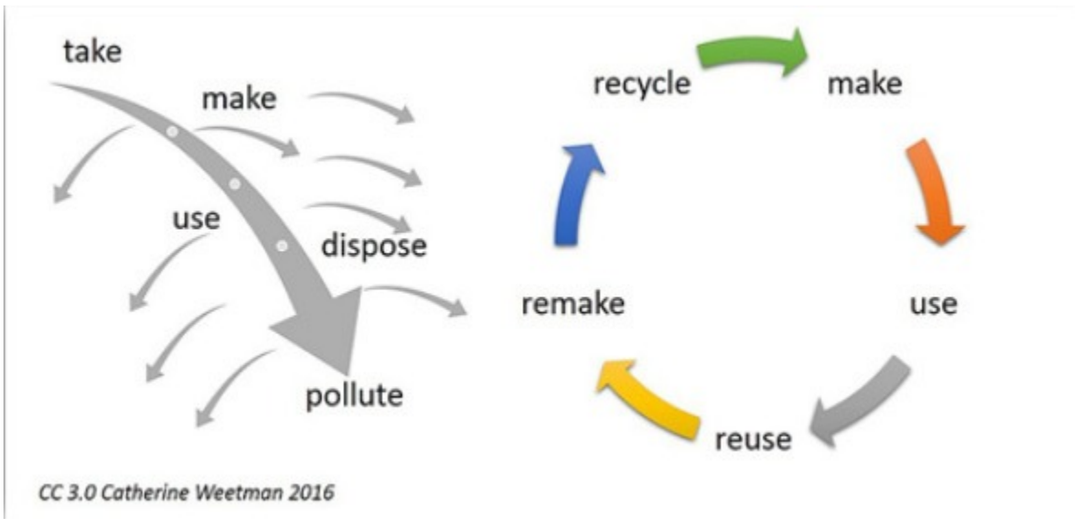
Fig. 2: Recycling system in Germany

Source: Needpix (Public domain).

Households in Germany separate their waste into multiple streams, including paper, plastics, bio-waste, and residual waste, using color-coded bins. Public awareness campaigns, strict regulations, and consistent infrastructure have resulted in Germany achieving one of the highest recycling rates in the world—over 66% according to Eurostat data. Recycling centers in Germany often offer public educational tours and workshops, showing visitors how materials are processed. By providing transparency and fostering environmental literacy, these centers help cultivate a culture of responsibility and active participation in waste sorting and recycling efforts. Facilities also invest in innovative technologies such as AI-powered sorting robots, automated conveyor systems, and blockchain-based waste tracking to improve efficiency and traceability. These advancements further support Germany's ambitious goals of moving toward a circular economy.

4. Netherlands' Circular Economy and Waste strategy - The concept of a circular economy represents a transformative shift from the traditional linear economic model ('take, make, dispose') toward a system that prioritizes resource efficiency, product longevity, repairability, and regeneration. In a circular economy, products are designed to have multiple life cycles, materials are kept in continuous use, and waste generation is minimized or even eliminated. One of the key principles of a circular economy is "designing out waste and pollution." This requires rethinking product design to ensure that goods are easier to disassemble, repair, and recycle. Another principle is "keeping products and materials in use" for as long as possible through sharing, leasing, repairing, refurbishing, and recycling existing materials and products. Lastly, "regenerating natural systems" emphasizes the importance of returning valuable nutrients to the environment, such as through composting organic waste. The Netherlands has embraced the circular economy as a national strategy, aiming to become fully circular by 2050. The Dutch government launched the "Circular Economy Programme" with sector-specific transition agendas for plastics, construction, consumer goods, biomass, and the manufacturing industry.

Figure 3: Circular Economy and Waste



Source: Creative Commons (Public domain).

A notable initiative is the Amsterdam Circular Strategy 2020-2025, which focuses on three main pillars: circular construction, circular consumer goods, and organic waste streams. The city promotes the reuse of building materials, supports repair cafes, and invests in urban farming projects that compost organic waste locally. In the consumer goods sector, Amsterdam encourages business models based on leasing rather than owning—for example, companies offering "light-as-a-service" rather than selling lightbulbs. Furthermore, Dutch companies like Fairphone design smartphones for easy repair and modularity, extending device lifespans and minimizing e-waste. In fashion, brands like Mud Jeans operate on a "lease a jeans" model where customers rent jeans and return them for recycling at the end of use, closing the material loop. The success of the Netherlands demonstrates that a systemic, government-supported approach combined with active business innovation and citizen engagement can create a robust circular economy model. Cities and countries around the world look to the Netherlands as an inspiring example of how rethinking waste and resource use can drive sustainable development.

5. Italy's Innovation in New Materials - Innovation in material science is a critical driver in reducing waste and supporting sustainable consumption patterns. Traditional materials, especially plastics and synthetic fibers, have been major contributors to pollution due to their non-biodegradable nature and reliance on fossil fuels for production. The emergence of new, environmentally friendly materials offers promising alternatives that align with the goals of waste minimization and circular economy principles. Biodegradable plastics are designed to break down naturally under specific environmental conditions, reducing the burden on landfills and the natural environment. These plastics are often derived from renewable resources such as corn starch, sugarcane, or cassava. Brands like NatureWorks have developed polylactic acid (PLA) bioplastics used in packaging, disposable utensils, and agricultural films. Mycelium, the root structure of fungi, is being harnessed to create packaging materials that are not only biodegradable but also strong and lightweight. Companies like Ecovative Design are leading this innovation, producing protective packaging alternatives to polystyrene foam. Once used, mycelium packaging can decompose in home compost bins within weeks. Innovations in the fashion industry are addressing the environmental impact of traditional textile production. Fabrics made from agricultural by-products like pineapple leaves (Piñatex), orange peels (Orange Fiber), and banana stems offer sustainable alternatives to leather and synthetic fibers. These materials require less water, pesticides, and energy compared to conventional crops like cotton. Algae, a rapidly renewable resource, is being explored as a raw material for bioplastics, foams, and textiles. Companies like Bloom have created flexible foams used in footwear

and sporting goods, replacing petroleum-based materials with algae biomass. Advances in recycling technology have led to the creation of high-performance composite materials from post-consumer waste. For instance, companies are producing construction panels, outdoor furniture, and even bicycle frames from recycled plastics and fibers. These products not only reduce landfill waste but also offer durable and versatile alternatives for various industries. Italy has emerged as a leader in sustainable textile innovation. Brands such as Orange Fiber have developed luxurious fabrics from citrus waste, collaborating with high-end fashion houses like Salvatore Ferragamo. Additionally, initiatives like Aquafil's ECONYL regenerate nylon waste, including discarded fishing nets and industrial plastics, into high-quality textile fibers used by major fashion brands. Italy's efforts demonstrate how new materials can transform waste into valuable resources while driving sustainability in traditionally resource-intensive industries. The development and adoption of new materials are essential for transitioning to a more sustainable and circular economy. As industries and consumers increasingly prioritize environmental impact, the demand for innovative, eco-friendly materials is expected to grow, further reducing global waste footprints.

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Youth Workers Corner n°4

Workshop n°1 Theme: Designing Our Circular Future - Hands-on exploration of organic waste management and community composting.

Purpose and Objective of the Workshop:
• To help participants understand the life cycle of organic waste and its environmental impact

• To develop practical skills in creating and managing compost systems. • To promote teamwork through the creation of a small-scale "Community Compost Lab." • To connect participants with circular economy principles and responsible consumption. Target Group and Optimal Group Size: • Youth workers and young people (16–30 years old). • Optimal group size: 12–25 participants (divided into small teams of 3–5).

Timing	Activity Phase	Description
10 min	Introduction	Short presentation on bio-waste, composting, and ecological benefits.
15 min	Waste Mapping	Teams identify sources of organic waste and discuss mismanagement problems.
35 min	Compost Lab Setup	Hands-on creation of a mini compost system using provided materials.
20 min	Observation & Measurement	Temperature, moisture, and material ratio assessments.
20 min	Presentations	Each team presents its mini compost system.
20 min	Wrap-up Discussion	Linking composting to community gardens and local sustainability.

Materials: Flipcharts, markers, sticky notes, A3 paper, projector, example objects

Duration: 2 hours

Proposed Workshop Procedure and Methods Used:
• Introduction (10 min)

- Brief presentation about organic waste streams, methane emissions, and why composting matters.
- Examples from Ljubljana, San Francisco, and community garden initiatives.

• Waste Mapping (15 min)

- Teams list daily sources of organic waste (at home, school, workplace).
- Discussion on preventable waste and potential resource recovery.

• Compost Lab Setup (35 min)
Participants build a mini compost system:

- Adding "green" (nitrogen-rich) and "brown" (carbon-rich) materials.
- Learning about aeration, moisture balance, and avoiding common mistakes.
- Understanding how decomposition works and how compost supports soil health.

• Observation & Measurement (20 min)
  - Teams measure temperature and moisture levels.
  - Evaluate mixture balance and discuss expected changes over time.
• Presentations (20 min)
  - Teams showcase their compost setups.
  - Explanation of selected materials, expected outcomes, and potential challenges.

• Wrap-up Discussion (20 min)
  - How composting reduces household waste.
  - How community composting supports local food systems and urban gardening.
  - Reflection on youth involvement in sustainable communities.

Required Materials and Estimated Duration:
• Small compost bins or boxes, gloves, organic materials (food scraps, leaves), thermometers, spray bottles, flipcharts, markers.

Final Discussion and Feedback:
• What did participants learn about organic waste as a resource?
• How could a community-based compost project be implemented locally?
Reflection: “What simple composting habit can I start tomorrow?”

Workshop n°2 Theme: Youth Voices for Circular Change - Creative upcycling as a pathway to circular economy thinking and waste reduction.

Purpose and Objective of the Workshop:
• To foster creativity through transforming discarded items into useful or artistic products.
• To help participants understand how to extend the life cycle of materials.
• To develop collaboration, problem-solving, and eco-design skills.
• To link recycling, reuse, and upcycling with circular economy principles.

Target Group and Optimal Group Size:
• Youth workers, youth leaders, and active young citizens (18–35 years old).
• Optimal group size: 15–30 participants.

Timing	Activity Phase	Description
10 min	Introduction	What is upcycling? Examples from San Francisco workshops and SCRAP.
15 min	Object Selection	Teams choose objects and analyse why they were discarded.
45 min	Upcycling Design Sprint	Creative hands-on transformation of materials into new products.
30 min	Exhibition & Feedback	Teams present their upcycled creations and receive feedback.
20 min	Reflection Circle	Discussion on consumption patterns and circular habits.

Materials: Role cards, EU policy handouts, markers, flipcharts, projector

Duration: 2 hours

Proposed Workshop Procedure and Methods Used:

• Introduction (10 min)
- Explanation of upcycling vs. reuse vs. recycling.
- Environmental benefits of creative reuse.
- Showcase examples such as Fix-It Clinics, SCRAP, and upcycled art.

• Object Selection (15 min)
- Teams choose from a collection of discarded materials (clothes, wood, electronics).
- They analyse:
  - Why the item was thrown away
  - How long its original life cycle lasted
  - What materials it contains and how it can be repurposed

• Upcycling Design Sprint (45 min)

Teams create a new product such as:
- Tote bags from old T-shirts
- Planters from wooden pallets
- Lamps or sculptures from electronic parts
- Jewelry or household items from scrap materials

• During the sprint, they apply circular design principles:
- Durability
- Repairability
- Modularity
- Minimal waste

• Teams prepare a concept poster illustrating their transformation process.

Exhibition & Feedback (30 min)
- Set up a small “Sustainability Fair.”
- Each group presents its upcycled product.
- Discussion on functionality, aesthetic value, and alignment with circular principles

• Reflection Circle (20 min)

Guiding questions:
• What consumption habits create unnecessary waste?
• How can upcycling workshops be integrated into youth centres or schools?
• Which new skills did participants gain today?

Required Materials and Estimated Duration:
• Discarded objects (clothing, wood, electronics, plastics), basic tools (scissors, cutters, hand tools), sewing materials, glue, paints, protective equipment, A3 paper, markers.

Final Discussion and Feedback:
• How does upcycling support a circular mindset?
• What barriers or opportunities exist in promoting creative reuse locally?
• Participants share one upcycling challenge they commit to completing in the next two weeks.

Podcast
Waste management and recycling

Video
Why waste management matters - Circular Economy

WASTE MANAGEMENT & RECYCLING

Turning Trash into Treasure

TYPES OF WASTE

Household Industrial Hazardous

RECYCLING STREAMS

Plastics Metals Glass

WHY IT MATTERS

Environment Health Resources Organics

WASTE MANAGEMENT SYSTEM

Collection → Sorting → Disposal → Innovation

GLOBAL INSPIRATION

- San Francisco Composting
- Ljubijana Zero Waste
- Germany Circular
- Italy Innovation

REDUCE · REUSE · RECYCLE · UPCYCLE

Powering and Hydrating Sustainably:

Energy & Water in the Circular Economy

Introduction

Think about your day. You flick on a light, charge your phone, take a shower, grab a drink of water. Energy and water are so fundamental to our lives that we often take them for granted. But the way we currently manage these vital resources – largely through a linear "take-make-dispose" model – is putting immense strain on our planet. We extract fossil fuels and freshwater, use them (most oftenly inefficiently), and release emissions and wastewater, contributing to climate change, pollution, and resource depletion.

What if there was a smarter way? The circular economy offers a transformative approach. Instead of disposal, it emphasizes keeping resources in use for as long as possible, extracting the maximum value from them whilst in use, then recovering and regenerating products and materials at the end of each service life. Applied to energy and water, this means focusing on radical efficiency, shifting to renewable sources, and reusing and recycling water whenever possible.

This chapter dives into the world of circular energy and water management. We'll explore why it's crucial, understand the key principles of energy efficiency and water conservation, look at how renewable energy fits in, and discover innovative ways water is being reused. We'll also examine real-world examples across Europe and discuss how you, as young people and youth workers, can be part of the solution, creating a future where both people and the planet thrive. Get ready to rethink how we power our lives and manage every precious drop!

Topics Covered

Our current energy and water systems are deeply intertwined with environmental challenges. Let's break down the key concepts for managing them circularly.

Energy Management & Efficiency - Using Less to Do More:

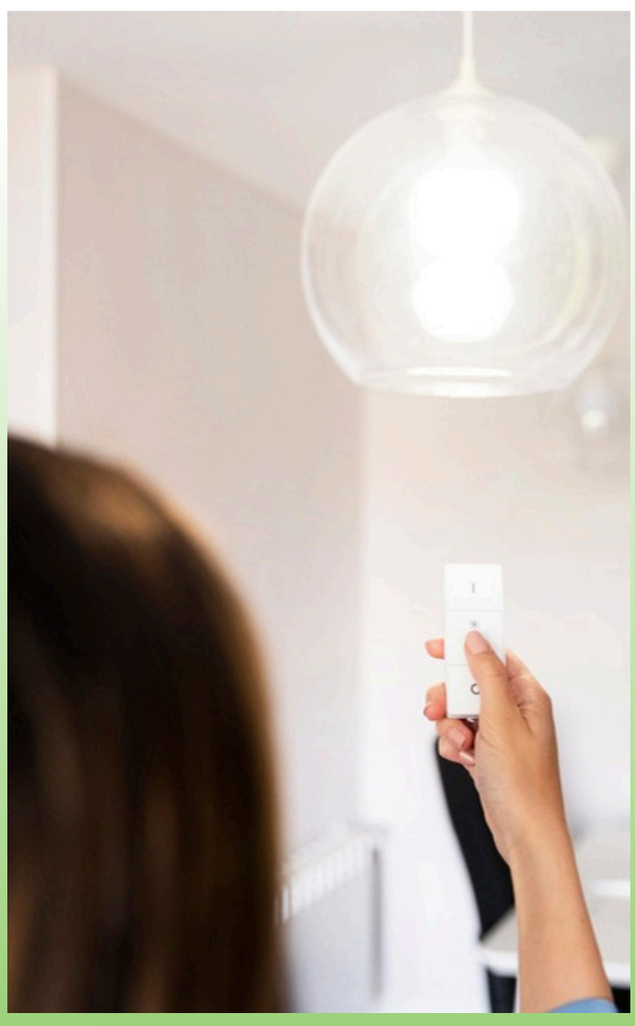
1. Our Energy Appetite - Modern society runs on energy. It powers our homes, schools, industries, and transportation. However, a large portion, especially in the EU, still comes from fossil fuels (coal, oil, gas), which release greenhouse gases when burned, driving climate change. Buildings alone account for about 40% of the EU's energy consumption and 36% of its energy-related greenhouse gas emissions (European Commission, EPBD).

2. Efficiency First - The cheapest, cleanest energy is the energy we don't use. Energy efficiency means achieving the same (or better) results with less energy input. Think of LED lightbulbs using far less electricity than old incandescent ones for the same amount of light, or well-insulated buildings staying warm in winter with minimal heating.

- In Buildings: Simple measures like insulation (walls, roofs, windows), draught-proofing, and efficient heating/cooling systems can drastically cut energy use. "Passive house" designs use clever architecture to maximize natural light and ventilation, minimizing the need for artificial heating, cooling, and lighting.
- In Appliances: Choosing appliances with high energy ratings (like the EU energy label) makes a big difference over the product's lifetime.
- Smart Technology: Smart thermostats learn your habits and adjust heating automatically. Smart grids can help balance energy supply and demand more effectively across entire cities or regions.

3. Shifting to Renewables - A truly circular energy system relies on sources that replenish naturally and produce little to no emissions

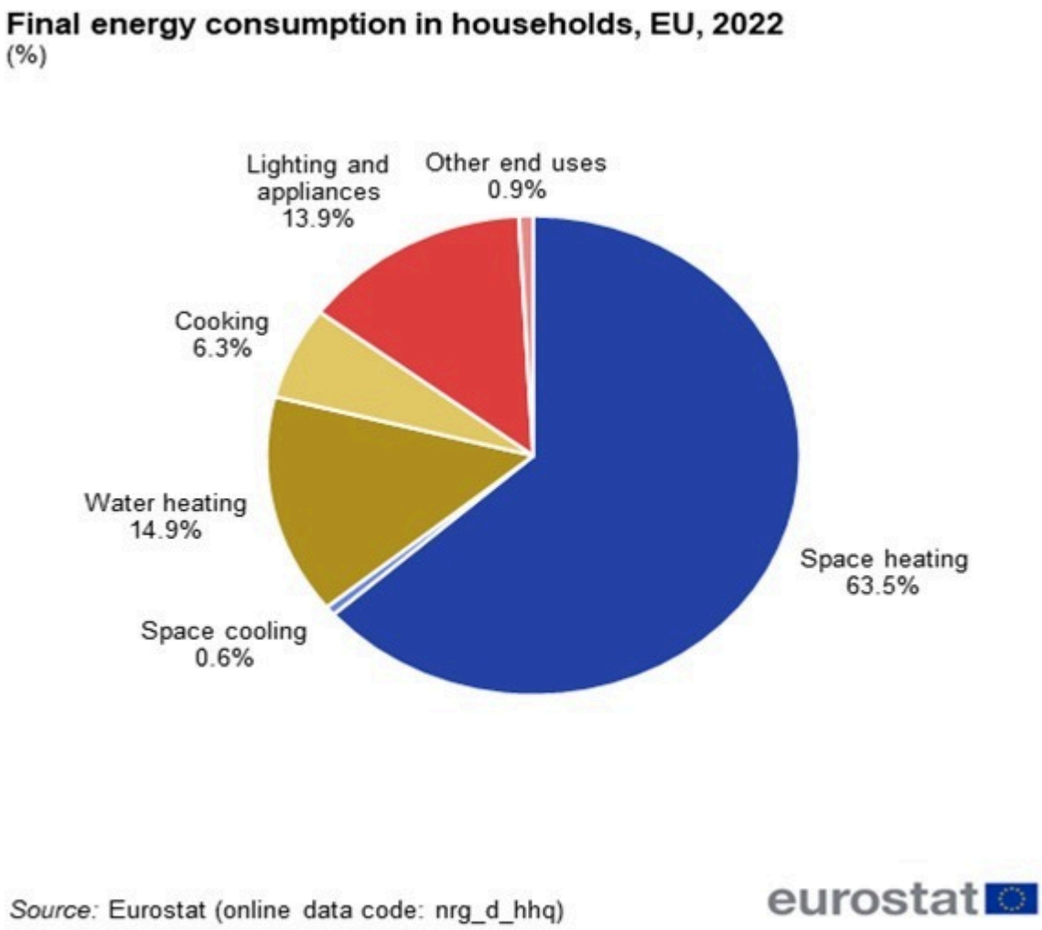
- Solar Power: Converting sunlight directly into electricity (photovoltaics - PV) or heat (solar thermal). Costs have plummeted, making rooftop solar increasingly common.
- Wind Power: Using turbines to capture wind energy, both onshore and offshore.
- Hydropower: Generating electricity from flowing water (dams, rivers).
- Geothermal Energy: Tapping into the Earth's internal heat for heating or electricity generation.
- Biomass: Using organic matter (wood, crops, waste) to produce energy, though sustainability depends heavily on sourcing.



4. Energy Recovery - The circular economy also looks at waste as a resource. Technologies like anaerobic digestion (breaking down organic waste without oxygen) can produce biogas, a renewable fuel. Waste incineration can generate heat and power, although reducing waste in the first place is always the priority.

5. EU Context - The European Green Deal sets the ambitious goal for Europe to be climate-neutral by 2050. Key policies include the Energy Performance of Buildings Directive (EPBD), pushing for near-zero energy buildings, and the Renewable Energy Directive (RED II), setting targets for renewable energy uptake.

Fig. 1Households energy consuption ratio



Source: Eurostat, 2024.

Water Consumption Reduction & Reuse: Valuing Every Drop

1. The Blue Gold - Like energy, water is essential for life, agriculture, and industry. While Earth seems covered in water, only a tiny fraction is accessible freshwater. Many parts of Europe already face water stress – where demand exceeds available supply – a situation expected to worsen with climate change (European Environment Agency).

2. Our Water Footprint - We use water directly (drinking, washing) and indirectly. This "virtual water" is embedded in the products we consume – it takes around 2,700 liters of water to produce one cotton t-shirt (Water Resources Institute, 2005) and thousands more for food items like meat.

3. Water Efficiency - Similar to energy, using water more wisely is key:

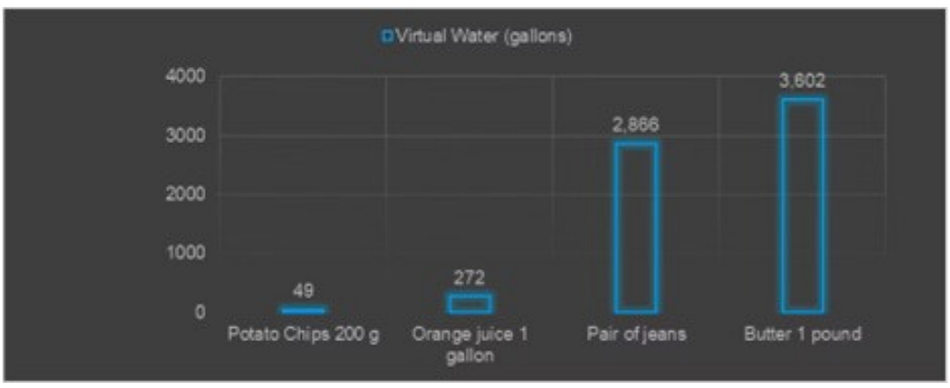
- At Home/School: Installing low-flow taps and showerheads, fixing leaks promptly, using dual-flush toilets, and choosing water-efficient appliances (dishwashers, washing machines).
- In Agriculture: This is the biggest water user globally. Techniques like drip irrigation deliver water directly to plant roots, minimizing evaporation losses compared to traditional sprinklers. Choosing crops suited to the local climate also helps.
- In Industry: Optimizing processes to use less water, and treating and recycling water internally.

4. Water Reuse & Recycling: Why use precious drinking-quality water for flushing toilets or watering gardens?

- Rainwater Harvesting: Collecting rainwater from roofs for non-potable uses like gardening or car washing.
- Greywater Recycling: Treating water from showers, baths, and washing machines for reuse in toilet flushing or irrigation. Requires separate plumbing and treatment systems.
- Reclaimed Water: Treating municipal wastewater to a high standard so it can be safely used for agriculture, industrial processes, landscape irrigation, or even replenishing groundwater.

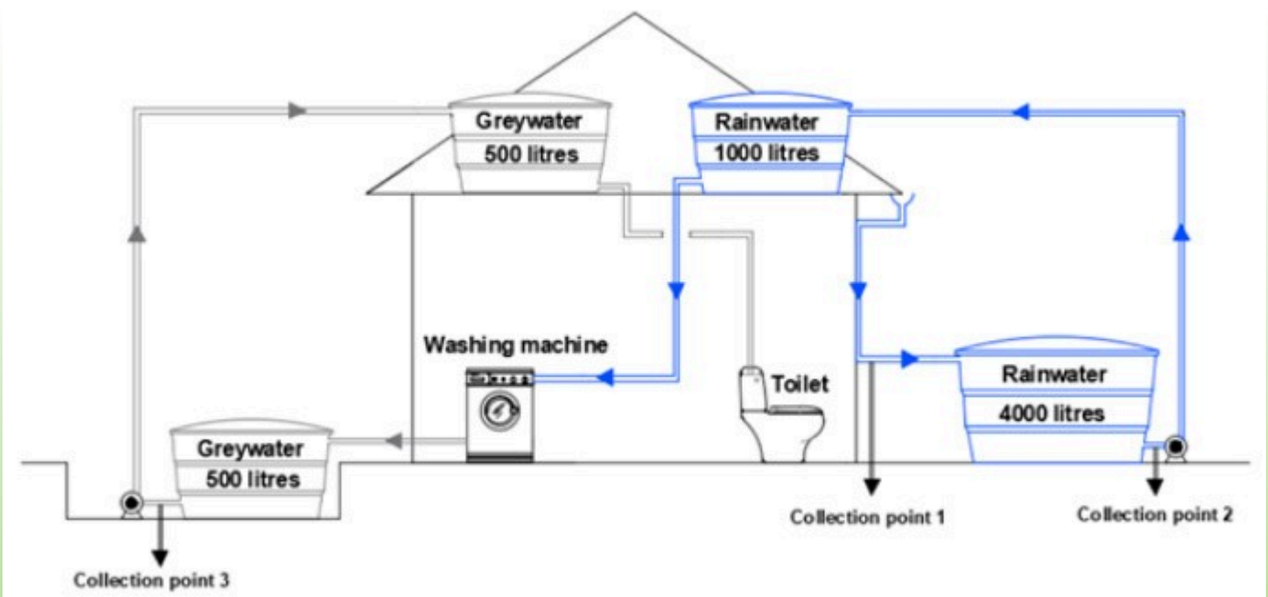
5. EU Context: The EU has several key water laws. The Water Framework Directive aims to protect and restore clean water across Europe. The Urban Wastewater Treatment Directive sets standards for collecting and treating wastewater. Crucially, the Water Reuse Regulation (fully applicable from June 2023) establishes minimum quality standards for using treated urban wastewater for agricultural irrigation, aiming to boost safe water reuse.

Fig. 2 Virtual Water & Water Footprint



Source: Maithriaqua, 2022.

Fig. 3 Water Reuse & Recycling



Source: Rosa, Ghisi, 2021.

The Energy-Water Nexus: A Connected Cycle

Energy and water are deeply interconnected.

- Energy for Water: We need energy to extract, treat, distribute, and heat water, and also to treat wastewater.
- Water for Energy: Power plants (especially thermal and nuclear) require vast amounts of water for cooling. Hydropower relies directly on water flows. Even extracting fossil fuels uses significant water.

Circular approaches recognize this nexus. For example, treating wastewater not only allows water reuse but can also generate biogas (renewable energy) and recover nutrients (reducing the need for energy-intensive synthetic fertilizers). Improving energy efficiency reduces the need for power plant cooling water, while improving water efficiency reduces the energy needed for pumping and treatment.

Best Practices and Real Case Scenarios

Circular energy and water principles are already in action across Europe.

1. Energy Efficiency Champions:

- Vauban District (Freiburg, Germany): A world-renowned sustainable neighbourhood featuring "passive houses" that use very little energy for heating, extensive solar panels, green roofs, and a focus on walking, cycling, and public transport.
- Community Energy Cooperatives (e.g., Ecopower, Belgium; Enercoop, France): Citizens collectively invest in and manage renewable energy projects like wind turbines or solar farms, promoting local energy independence and acceptance.
- Industrial Symbiosis (Kalundborg, Denmark): A classic example where companies exchange resources – one company's waste heat becomes another's energy input, reducing overall resource consumption.

2. Water Reuse Innovators:

- Spain & Italy: Facing significant water stress, these countries are leaders in using treated wastewater (reclaimed water) for agricultural irrigation, reducing pressure on freshwater sources. Strict quality controls ensure safety (Referencing EU Water Reuse Regulation context).
- Singapore's NEWater: While outside Europe, Singapore is a global pioneer in treating wastewater to ultra-pure, potable standards, demonstrating the technological potential.
- Urban Greywater Systems (e.g., Bo01 district, Malmö, Sweden): New developments incorporating systems to treat and reuse greywater locally for non-potable uses.
- Water Europe's Initiatives: This platform promotes innovation in the water sector, showcasing projects on smart water management, resource recovery from wastewater, and water-smart industries across Europe (Referencing Water Europe source).

3. Youth in Action:

- School Energy Audits: Students analyze their school's energy use and propose efficiency measures (e.g., installing LED lighting, awareness campaigns).
- Community Water Monitoring: Youth groups participate in citizen science projects to monitor local river health and raise awareness about pollution.
- Upcycling Workshops: Teaching peers how to repair electronics or repurpose materials, reducing waste and the embedded energy/water used in manufacturing new items.

The Energy-Water Nexus: A Connected Cycle

Transitioning to a circular economy for energy and water isn't just an environmental necessity; it's an opportunity to build a more resilient, efficient, and equitable future.

1. Key Benefits:

- Environmental: Reduced greenhouse gas emissions, less pollution, conservation of finite resources, protection of ecosystems.
- Economic: Lower energy and water bills, reduced reliance on volatile global fossil fuel markets, creation of green jobs (in renewables, efficiency, water tech, repair), opportunities for innovation.
- Social: Improved public health (cleaner air and water), increased resource security, potential for greater community resilience through local energy/water systems.

2. Recommendations for Youth & Youth Workers:

- Be Informed: Understand your own energy and water footprint. Learn about local and global challenges and solutions.
- Be Efficient: Practice energy and water saving habits at home, school, and in your community. Choose products wisely.
- Be an Advocate: Talk to friends, family, and local decision-makers about the importance of circularity. Support policies promoting renewables, efficiency, and water reuse.
- Be Innovative: Participate in projects, challenges, or workshops focused on sustainable solutions. Think creatively about reducing waste and conserving resources.
- Support Green Skills: Encourage learning and training in areas related to renewable energy installation, building retrofitting, water management technology, and repair/reuse sectors.

3. Challenges:

- Infrastructure: Upgrading energy grids and water systems requires significant investment.
- Policy & Regulation: Consistent and supportive policies are needed across all levels of government.
- Behavior Change: Shifting habits and consumption patterns takes time and effort.
- Skills Gap: Ensuring the workforce has the necessary skills for green jobs.
- Upfront Costs: While often cheaper long-term, some efficiency measures or renewable installations have higher initial costs.

Moving towards circular energy and water systems is essential for achieving climate goals and ensuring sustainable resource management. By embracing efficiency, renewables, and reuse, we can power and hydrate our societies in a way that respects planetary boundaries and creates lasting value. Young people are crucial drivers of this change, bringing fresh perspectives, energy, and a powerful voice for a sustainable future.

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Youth Workers Corner n°5

Workshop n°1 Power Loop Challenge: Mapping Our Daily Energy & Water

Theme
Exploring the invisible systems that power our lives and discovering how circular thinking can make them sustainable.

Purpose and Objective of the Workshop
• This activity helps young people visualize how energy and water move through everyday lifeat home, school, or in their community and how these flows could become circular. By mapping, role-playing, and redesigning systems, participants will understand the link between efficiency, renewables, reuse, and behavioural change. The goal is to inspire small, collective actions that reduce waste and encourage resource regeneration.

Target Group and Size
• Target Group: Young people aged 14–24
• Optimal Group Size: 10–18 participants

Proposed Workshop Procedure and Methods Used
• Step 1: Warm-up – "Where Does It Come From?" (10 minutes) Invite participants to stand in a circle. Ask quick questions: "Where does the energy for this light come from?" "Where does your shower water go?" Have participants toss a soft ball as they answer. The facilitator sketches answers on a flipchart, showing how few people know the full cycle. Introduce the idea of linear vs circular systems.

• Step 2: Energy–Water Flow Mapping (15 minutes) Divide into small groups. Each group receives a blank "household map" sheet and coloured arrows. They trace how energy and water enter, are used, and leave. Encourage detail: electricity to lighting to waste heat to environment; water to kitchen to wastewater to sewer.

• Step 3: Circular Re-Design (20 minutes)

Challenge groups to redesign their map using circular principles:
• Where can we reduce consumption?
• Where can energy or water be reused or recovered?
• What new technologies or habits could close loops?

Provide cards with ideas (solar panels, greywater reuse, insulation, smart meters, rainwater harvesting, etc.) that they can paste on their redesigned flow. • Step 4: Gallery Walk & Discussion (10 minutes)

Groups present their circular maps. Others leave sticky-note comments: "What I liked," "One new idea," "A question."

Discuss patterns: Which ideas appeared most? What seemed hardest?

• Step 5: Personal Connection (5 minutes)
Ask participants to note one change they could implement this week at home, school, or youth centre (e.g., turning off standby electronics, shorter showers, fixing a leak, reporting waste).

Required Materials and Estimated Duration

- Flipchart paper, markers, coloured arrows or string, sticky notes, “solution cards,” tape.
- Duration: 60 minutes Setup time: 10 minutes Final Discussion and Feedback

Closing circle: “What new connection did you see between energy and water?”
“What’s one loop you can help close in your daily life?”

Facilitator debrief: highlight that circular thinking unites environmental, social, and economic sustainability—and that youth can influence both habits and local policy decisions (e.g., school retrofits, water-saving projects).

Video
Energy and Water Intervined

Transportation

Introduction

Imagine a world where cities hum quietly with the sound of electric buses, where clean air fills your lungs as you bike to school, and where highways are no longer clogged with traffic jams but transformed into green corridors. Imagine transport that doesn't cost us our health or the planet. Sounds utopian? It doesn't have to be. A sustainable future for transportation is possible—and necessary.

Transportation is a part of our daily lives. It's how we get to school or work, how goods travel across countries, how we visit loved ones, or escape to new places. It's essential to our modern world—but it's also one of the biggest contributors to climate change and environmental degradation.

Globally, transportation is responsible for nearly one-quarter of CO_2 emissions a figure that continues to rise. Whether we're talking about cars, planes, trucks, or ships, our mobility relies heavily on fossil fuels, and the costs are not just environmental. Noise pollution, smog, traffic stress, and road accidents affect millions daily.

The way we move is not sustainable. But the good news? We can change that. In this chapter, we will explore the environmental impact of transportation, innovative policies driving change in Europe, sustainable alternatives to our current systems, and how young people can be leaders in creating a cleaner, more equitable way of moving through the world.

The Enviromental Cost of Transport

Let's be real: transportation is polluting—massively. From the carbon emissions of our daily commutes to the hidden environmental footprint of transporting goods across oceans, every mile matters. Here's how different sectors contribute:

1. Road Transport: The Carbon Giant - Road transport is the heavyweight champion of emissions in this sector, making up around 75% of all transport-related CO2 emissions. The biggest culprits?

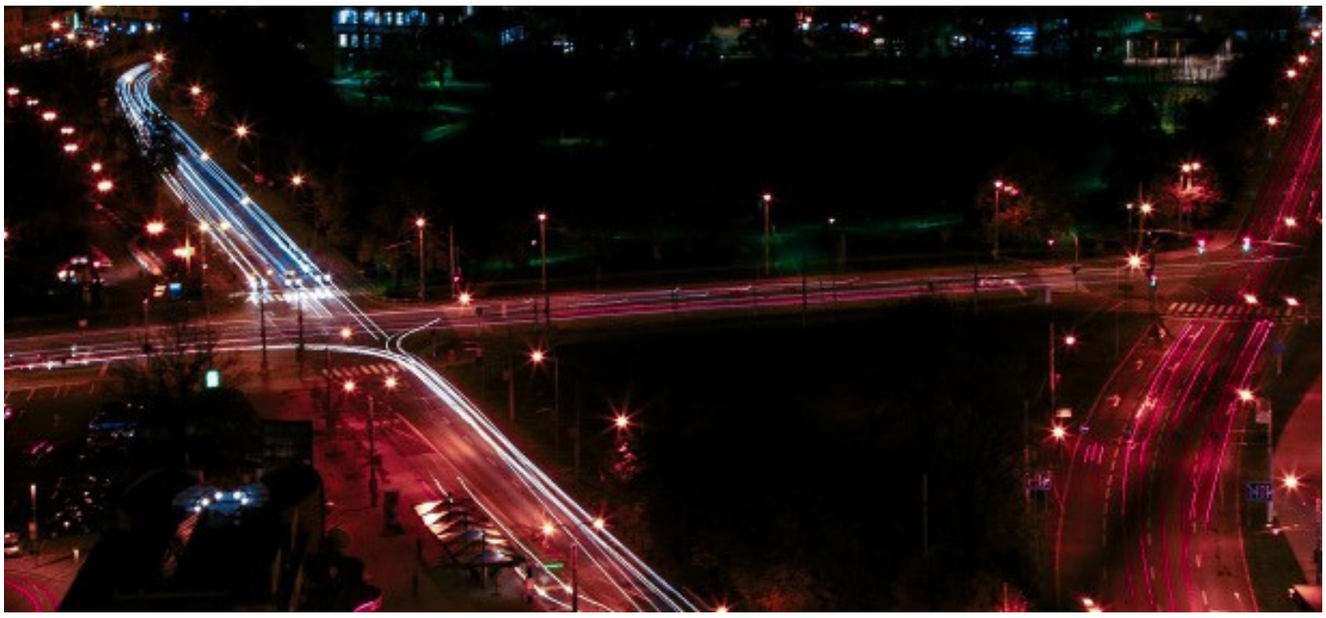
Aviation makes up 11.6% of transport emissions and is one of the fastest-growing sectors. A single roundtrip transatlantic flight can emit as much CO_2 as an average person in the EU produces from heating their home for a whole year. The issue with aviation isn't just the CO_2—it's also the non-CO_2 effects at high altitudes, like contrails and nitrous oxides, which have a warming impact that is often underestimated.

3. Maritime Transport: The Silent Polluter - Ships might seem efficient when compared to planes, but maritime transport contributes 10.6% of emissions from transport. Cargo ships run on heavy fuel oil, one of the dirtiest fossil fuels. Many ports are also located in poorer communities where pollution levels are disproportionately high. Worse still, the shipping industry remains under-regulated compared to other sectors and is only beginning to face climate accountability.

4. Rail and Active Transport: The Unsung Heroes - Only 1% of transport emissions come from rail. Trains—especially electrified ones powered by renewables—are one of the most climate-friendly ways to travel. Meanwhile, walking and cycling have virtually zero emissions, and their benefits extend far beyond the environment—they support public health, reduce noise, and make streets safer and more enjoyable.

- Passenger vehicles—cars, vans, buses—account for 45.1%. The majority of them run on gasoline or diesel, emitting carbon dioxide, nitrogen oxides, and particulate matter.
- Freight trucks contribute another 29.4%, and their emissions are growing as online shopping and just-in-time logistics rise in popularity. Beyond emissions, cars also take up enormous space in cities, create noise pollution, and pose safety risks—especially to pedestrians and cyclists. In Europe, road traffic accounts for over 20,000 deaths annually, most of them in urban areas.

2 Aviation: Flying High, Emitting Higher - Flying is one of the most carbon-intensive ways to travel, particularly over short distances where alternatives often exist.



European Policies for a Greener Transport Future

Europe is not sitting idle. The EU is implementing some of the world's most ambitious policies for sustainable transport. Here are some of the key initiatives:

1. Fit for 55: Making Emissions Reduction Law - The Fit for 55 package aims to reduce greenhouse gas emissions by 55% by 2030, compared to 1990 levels. For transport, this means:

- Expanding carbon pricing to road transport and aviation.
- Phasing out internal combustion engine vehicles.
- Investing in zero-emission technologies and infrastructure

It's a bold plan that links climate targets with legal obligations—and it's forcing industries and cities to rethink mobility.

2.European Green Deal: The 2050 Vision - The European Green Deal is even more ambitious. It targets a 90% reduction in transport emissions by 2050. Key pillars include:

- Promoting clean vehicles—including electric cars, hydrogen buses, and cargo bikes.
- Shifting more people and goods to rail and inland waterways.
- Creating smart mobility systems—like integrated ticketing and real-time travel data.
- Supporting cities in developing sustainable urban mobility plans (SUMPs)
- This isn't just about carbon—it's about making transportation healthier, safer, and more accessible.

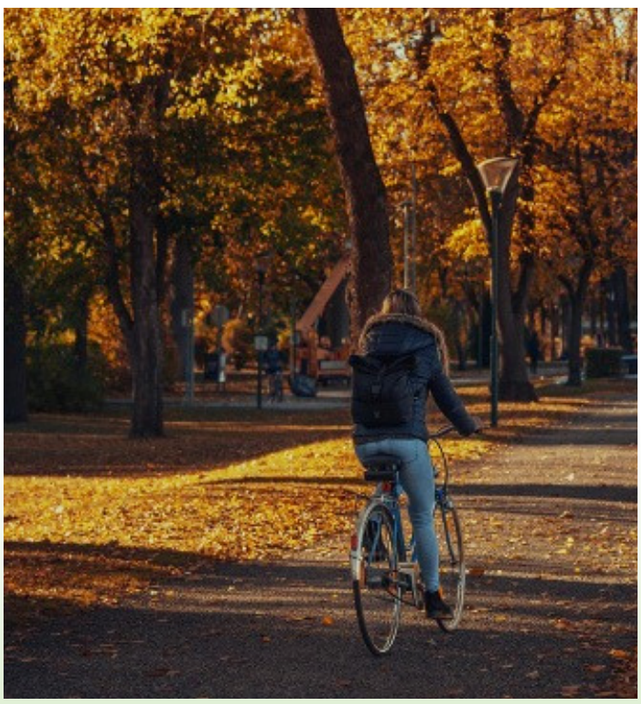
3. Single European Sky: Greener Skies Ahead - The Single European Sky initiative is designed to reduce emissions from aviation by optimizing flight paths across Europe. Currently, national air traffic systems force planes to take inefficient routes. Smarter, unified airspace management could cut emissions from aviation by up to 10%.

Rethinking the Way We Move

What does sustainable transport look like in everyday life? Here are some practical and powerful alternatives:

1. Walking and Cycling: The Original Clean Mobility - For trips under 5 km, walking or biking is often faster, cheaper, and healthier than driving. Cities that invest in wide sidewalks, protected bike lanes, and car-free zones see:

- Lower CO_2 emissions.
- Better air quality.
- Reduced traffic injuries.
- More active, connected communities



Programs like bike-sharing schemes and subsidies for e-bikes are making cycling more accessible in many European cities.

2. Public Transport: Moving Together, Emitting Less - From subways and trams to regional trains and buses, public transport can move thousands of people using a fraction of the energy of cars. One full electric bus can replace 40 cars on the road. Trains powered by renewable energy emit almost zero CO_2 per passenger kilometer. Investing in punctual, affordable, and clean public transport is one of the most powerful ways to cut emissions and improve urban life.

3. Carpooling and Shared Mobility - Sometimes we still need cars—but we don't all need our own. Carpooling platforms, ride-sharing apps, and car clubs reduce the number of vehicles on the road, cut costs, and foster community.

Shared mobility isn't just for passengers. Shared logistics services are helping local businesses deliver goods efficiently, reducing the number of delivery vans in city centers.

The Electric Revolution

Switching from combustion engines to electric vehicles (EVs) is one of the most significant steps we can take toward decarbonizing the transport sector—and reshaping the way we move for the better.

At first glance, electric cars might seem like regular vehicles with a plug instead of a fuel cap. But the shift to EVs is more than a simple technical upgrade—it's a revolution in how we think about mobility, energy, and urban life. Unlike conventional petrol or diesel vehicles, EVs produce zero tailpipe emissions, meaning they don't release harmful gases like carbon dioxide, nitrogen oxides, or particulate matter into the air we breathe. This makes them especially valuable in densely populated urban areas where air pollution is a serious health threat.

But the benefits of EVs go beyond the visible. Electric motors are far more energy- efficient than internal combustion engines, converting around 85–90% of electrical energy into movement, compared to just 20–30% in traditional cars. They also require less maintenance—no oil changes, fewer moving parts, and quieter operation make them not only cleaner but also cheaper to run over time.

However, EVs are only as green as the electricity that powers them. That's why pairing electric mobility with renewable energy—solar, wind, or hydro—is critical. Imagine charging your car with electricity generated from your rooftop solar panels: a true zero-emission loop. Some cities and energy providers now offer green charging stations, which prioritize clean energy sources and make the entire system more sustainable.

Still, the road to full electrification isn't without its bumps. EVs rely on batteries that require raw materials like lithium, cobalt, and nickel, often mined under environmentally and ethically questionable conditions. That's why researchers and companies are racing to develop next-generation batteries that are more efficient, recyclable, and ethically sourced.

The success of the electric revolution also depends on accessibility. We need more public charging stations, especially in rural areas and low-income neighborhoods. Governments across Europe are investing heavily in charging infrastructure and offering incentives—such as subsidies, tax breaks, and toll exemptions—to encourage the adoption of EVs.

From e-bikes to electric buses and cargo vans, the electrification of transport offers a powerful tool in our fight against climate change. But it's not just about plugging in—it's about plugging into a future that's cleaner, quieter, and more just for everyone.

1. Electric Bikes and Scooters - Perfect for short commutes, e-bikes and e-scooters are fun, efficient, and climate-friendly. They:

- Avoid traffic.
- Are cheap to operate.
- Require very little space.
- Emit zero tailpipe emissions.

Some cities, like Paris and Milan, offer public e-scooter fleets and subsidies to buy personal e-bikes.

2. Electric Cars: Cleaner, But Not a Silver Bullet - EVs emit less than half the CO_2 of fossil-fuel cars over their lifetime—even when powered by the current energy mix. They also:

- Produce no exhaust fumes.
- Reduce noise.
- Lower running costs for users.

However, EVs still require materials like lithium, cobalt, and nickel. The shift to electric must be paired with lower car dependency, not just replacing all petrol cars with electric ones.

3. Charging Infrastructure: The Missing Link - Access to charging remains a key barrier to EV adoption. The EU is aiming to install over one million public chargers by 2025, focusing on highways, cities, and rural areas alike.

Youth as Catalysts for Change

Young people are not just passengers in the mobility revolution—they're driving it. Opting for a bike instead of a car. Taking the train instead of flying. Using an e-scooter instead of calling a taxi. These everyday decisions add up.

Youth are organizing around issues like:

- Car-free cities
- Safer cycling infrastructure
- Climate-friendly school transport

Movements like Fridays for Future have put transport policy on the political agenda. Whether through TikTok videos about low-waste travel or organizing a local "bike-to-school" week, youth have the tools to shift mindsets. Young people across Europe are participating in city councils, EU youth

dialogues, and climate forums—demanding stronger action on transport emissions and urban equity.

Best Practices and Case Studies

1. Copenhagen, Denmark – Over 60% of trips in the city are made by bike. The city also runs electric buses and car-free streets.

2. Barcelona's Superblocks – Mini-neighborhoods where cars are limited, and walking and socializing take center stage.

3. The Netherlands' "OV-fiets" – Bike rentals integrated with train stations, allowing seamless multimodal travel.

4. Slovenia's Sustainable Mobility Week – A national campaign that includes walk-to-school days, car-free city events, and transport workshops.

Conclusion: Rerouting Our Future

The way we move today is harming our future. From clogged motorways and polluted skies to rising global temperatures and worsening inequalities, our current transport systems are simply unsustainable. Every time a car engine starts or a plane takes off, it adds to the invisible burden our planet carries—more carbon in the atmosphere, more heat trapped on Earth, and more communities left behind in the rush of development.

But here's the good news: transportation is not set in stone. Roads can be redesigned, habits can be changed, and policies can be rewritten. With smart choices, bold legislation, and collective commitment, we can reroute the way we move—toward a cleaner, healthier, and more equitable path.

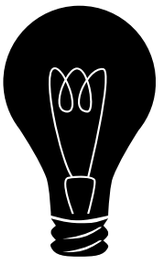
This isn't just about switching cars for bikes or plugging in instead of filling up. It's about rethinking our relationship with movement itself. Do we really need to travel as much as we do? Can we design cities where everything essential is within walking or cycling distance? Can we prioritize access over speed, and well-being over convenience?

The shift toward sustainable transport isn't just a technical fix—it's a cultural one. It challenges the car-centric mindset that has dominated urban planning for decades. It calls for new models of sharing, cooperation, and fairness. It asks us to consider who benefits from mobility—and who gets left out.

Young people have an especially important role to play. Your choices matter. Your voices are powerful. Whether you're advocating for bike lanes in your town, organizing a ride-share group at school, or calling out airline overuse on social media, you're part of a growing movement. One that doesn't accept traffic jams and smog as the status quo, but dares to imagine something better.

The journey toward sustainable transport is not a straight road. It will take time, effort, and creative thinking. But every step we take—every bus we board, every walk we choose, every policy we support—brings us closer to a world where movement no longer means destruction, but possibility.

We don't just need to move—we need to move differently. And the time to change course is now.



Summary and Key Implications

1. Transport is a major source of emissions—especially road and air travel.

2. EU policies are driving a transition to sustainable, multimodal mobility.

3. Active and shared transport options offer major environmental and social benefits.

4. Electrification is important, but must go hand-in-hand with reducing car dependence.

5. Youth can shape the mobility revolution through advocacy, lifestyle choices, and education.

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Youth Workers Corner n°6

Workshop n°1 Theme: Circular journey – waste-free transport

Purpose and objective of the workshop: students/ young people will practice the principles of the circular economy such as sharing, reusing, recycling or repairing in transport.

Target group and optimal group size: youth, young leaders, students, optimal group size: 20-30.

Proposed workshop procedure and methods used:

- The moderator will divide students/young people into teams, smaller groups of 3-5 people
- Each team will choose or randomly draw a type of transport or role
  - proposals for types of transport: road, rail, bicycle, scooter, air, urban, intercity, interstate, road transport
  - proposals for roles: driver of e-scooter, cyclist, skater, public transport driver, public transport, pedestrian
- Teams will prepare proposals (can be a poster, project, with a slogan) for functioning of the selected type of transport using principles of circular economy (sharing, reuse, recycling or repair);
- Teams mainly concern themselves with principles of circular economy (Duration: 20 minutes; depends on the number of people and the number of teams) Possible examples:
  - shared scooters, repair single
  - shared bicycles, repair
  - renewable energies for road, rail transport
  - repair of means of transport instead of replacement
  - use of recycled materials for repair and production of means of transport
  - Transport bazaar, cycle bazaar
- Each team presents its concept of functioning transport type using the principles of circular economy (Duration: 20 minutes; depends on number of people and number of teams)
- Voting for most innovative concept of functioning transport type using the principles of circular economy (Duration: 10 minutes)
- Voting for most realistic concept of functioning transport type using principles of circular economy (Duration: 10 minutes)

Required materials and estimated duration

• Required materials: suitable room with equipment, drawings, highlighters, pens, flipchart, board

• Estimated duration: 60 minutes

Final discussion and feedback:

- Joint discussion about the presented proposals and possibilities for real application in their city, community, region. The output can be a transport system proposal in form of a model, poster or presentation. The moderator can give the participants feedback on proposal – for example, on applied principles of circular economy, innovation, reality.

Workshop n°2 Theme: What is our transport footprint?

Purpose and objective of the workshop: young people/students explore the impacts of different forms of transport and travel, and learn to design alternative forms with a lower carbon footprint and circularity principles Target group and optimal group size: youth, young leaders, students, optimal group size: 20-30. Proposed workshop procedure and methods used:

- The moderator will divide students/ young people into teams, smaller groups of 3-5 people or participants can work individually
- Each group, team of students or individual will choose or randomly draw a role of a passenger or profession.
  - Suggestions for role of a passenger or profession: student living in the city; student coming from the suburbs; teacher from the city; teacher from the suburbs; family with children; courier; pensioner living in the city; a pensioner from the suburbs; a public transport driver; a company sales representative; a food delivery service; a taxi driver; a firefighter; an ambulance
- Before examining and calculating the impacts, a discussion will take place among students about how they travel to school? How do their parents travel to work? How often do they travel/use, for example, a car, bus, train, bicycle, scooter, walking, motorbike, other ways of transport? (Duration: 10 minutes)

Teams will then use available online calculators for calculating the carbon footprint of transport to calculate an estimate number of emissions and impacts associated with transport.

  - online calculator's examples:

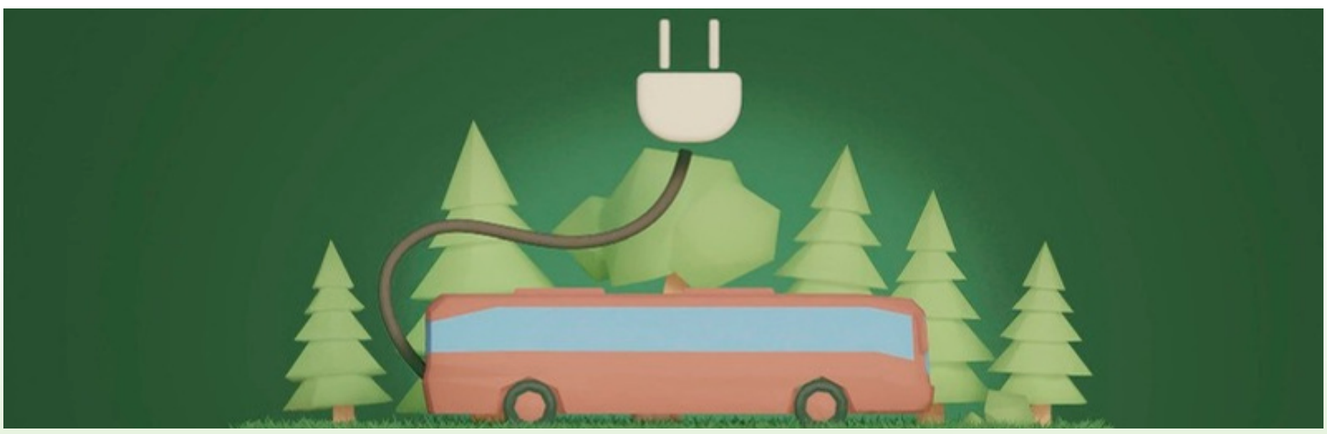
- Slovak version: https://iep.sk/Kalkulacka
- English version: https://www.futuretracker.com/whats-your-commuting-carbon-footprint (Duration: 15 minutes)

- Teams present and inform about the results of calculations of emissions estimates and impacts related to transport (Duration: 10 minutes)

- Teams then propose options for how the determined profile of consumed emissions could be improved and transformed through the principles of the circular economy (Duration: 10 minutes)
  - proposals can be dedicated, for example, to shared rides, shared means of transport, repairs instead of buying, recycling, remanufacturing.

- Teams present their proposals for improving and transforming the consumption emission profiles for their characters or professions (Duration: 10 minutes)
- Required materials and estimated duration:
  - Required materials: suitable room with equipment, drawings, highlighters, pens, flipchart, board

- Estimated duration: 60 minutes Final discussion and feedback: At the end of workshop and after presenting all proposals, the goal can be to create a common Circular Transport Plan that includes all characters, roles and professions. At the same time, a joint discussion takes place on possibilities of a real applying in practice and society. The final output can also be a poster, infographic or map of a circular transport plan using the principles of circular economy.



Video
Circular Economy and Transportation

Podcast
Disponsable World, Crucial Fix

Achieving Sustainable Food and Water consumption

The importance of food and water in the enviroment

Every meal you eat and every drink you take connects you to people, places, and the planet's fragile ecosystems. Food and water aren't endless: they are precious resources under pressure from overuse, pollution, and climate change. This chapter focuses on choices we can make concerning food and water that can have a positive effect on the environment.

The essential resources for keeping everyone alive face unprecedented stress: by 2050, global food demand is projected to rise by nearly 50%, while freshwater shortages will affect two-thirds of the world's population. Just imagine a world in which there are obstacles to having enough water to drink or in which food prices are making it difficult for all people to cover their needs. Water and food are key elements of our world affecting the environment and climate change. Overuse of water for irrigation, pollution from agrochemicals, and unsustainable farming practices are draining rivers, degrading soils, and threatening biodiversity. At the same time, the food system generates roughly 30% of global greenhouse gas emissions, from land-use change to transportation. Hence, it is important to understand these connections between what one eats, what one drinks, and the health of our planet, one can make choices that support a path towards environmental balance.

Big Idea: Consumption as a Climate & Justice Issue

Every burger, banana, or bottle has a backstory: land cleared for grazing, rivers pumped dry, workers paid little. By reshaping what we buy and how we use it, we protect ecosystems and ensure fair access to essentials. In effect, environmental footprints are strongly connected with how we consume food and water. Intensive meat production, monocrops, and bottled water profiteering often come at the expense of smallholder farmers, indigenous lands, and equitable access to clean water. Framing consumption as both a climate emergency and a human-rights concern empower you to demand transparency, fairness, and sustainability. By aligning daily choices with global impact, you transform personal habits into political actions turning your plate and glass into instruments of change.

Let's look at what we eat

Did you know that not all food has the same effect on the planet?

Of course everybody needs to eat something to survive. But what one eats can make a difference to the environment and climate change. Indeed, there are specific foods that have more negative effects over the environment. Though it is not easy to make complete changes on your diet, decreasing the quantity and frequency of some of the foods you eat can be beneficial to the environment.

For example, sustainable diets emphasize plant-based foods, local sourcing, and minimal processing—balancing nutritional needs with environmental impact. Going for example on a full vegan diet can allow you to keep exercising, studying, dancing, etc without significantly costing the planet. And if it is hard to abandon meat (for some it is!) just avoiding a burger now and then can have a positive effect.
Moreover, one can make a difference when caring about the packaging in which food is delivered. Try to avoid plastic bags, plastic packaging in general or select no packaging options (when this is possible!).

Even going to a cafeteria with your own mug or container can make a difference – can you imagine how many single-use containers and cups are used every year? A study of WWF highlighted that 4.1 billion single-use drinks cups and lids, and 5.2 billion plastic food containers where to be used in one single year just in the UK, while a UN survey concluded that single-use cups are used for an average of just 15 minutes before going to waste! And if one thinks that this is ok if these cups are then recycled, the same survey stresses that less than 2% of coffee cups are recycled worldwide.

Finally, maybe to the most extreme but hear this out, have you ever thought about which place your food comes from? Is it a nearby place or is it produced in foreign countries, maybe very far away? Research has shown that ultra-processed foods, those chips, sodas, etc, or food that are out of season where you live (e.g. these grapes over winter) are often produced in places that are far away from where you live. This means that for having them significant transportation was required.

This is hardly the case for fresh food – because of their high sensitivity they are most likely produced in a place near you live. This is also why urban agriculture is gaining traction as it limits transportation needs and can be more closely associated with urban water recycling, which is an important issue as it will be explained further on. Likewise, green roofs as a circular economy innovation are spreading across many cities in the world.

Let's look at how we affect water consumption

The latest data clearly highlights that water scarcity is becoming a fact for many more countries than ever before, affecting millions of people, rendering its conservation vital. Each one can make a contribution to limiting water use and especially waste. Think for example that bath you took last week – showers are much less water consuming. Research has shown that a 5-minute shower would use approximately 35-95 liters of water while a proper bath requires around 250. Using low-flow showerhead can make the shower even more environmentally friendly!

Modern practices are also focusing on collecting shower water, recycling it and reusing it for uses such as toilet water. The same is being done for water used to clean your hands. When recycling water is done more prudently can lead to expanding its usage to watering plants or being given to livestock.

On the other hand, significant water waste is recorded in agriculture. A recent World Bank study showed that though agriculture uses around 65% of total fresh water, almost have of it is wasted – there is no special focus on decrease such waste. Just imagine that the time selected by farmers to water their crops can reduce water waste by 10-25% (morning times versus noon times). This is caused because of lower evaporation rates and better plant uptake while also leading to reduced fungal risk.

Again, water reuse and recycling of irrigation water can positively affect the amounts of water required to grow the plants and livestock needed to feed the world population. Moreover, just think that every agricultural product, from almonds to avocados, carries a "water footprint"—the total water used in growing, processing, and transporting. Avocados are rather water-intensive, but livestock requires significant amounts of water. According to a 2021 study, a diet focused on plants uses up to 53% of the water resources required for a diet focused on livestock.

Overall, practices such as regenerative farming, agroecology, and drip irrigation restore soils, boost biodiversity, and cut water use. These practices close loops by cycling nutrients and water on the farm. And though it might sound very complicated and distant from our day-to-day lives, small acts of consumers can support these trends: shop at farmers' markets or support community gardens.

Fig. 1 Quick Facts Water Requires

Source: FAO, 2017

Let's look at how we affect water consumption

Our civilization is responsible for the following accomplishments: globally, onethird of all food is wasted each year, while at the same time around 800 million people go hungry. Food waste is a resource drain: land, water, labor, and energy lost.

From fridge leftovers to plate scrapings, wasted food is wasted resources from our global resources bank – which is not abundant. Through learning to plan meals, storing food properly, and reutilizing scraps (compost, ferment, or turn trimmings into snacks) one can make a difference.

One very interesting issue is that of labelling. Many people think that they should not eat food after the "Best before" date, which is not the case! In France, the government introduced two additional labels to follow the "Best before" date, namely "for minimum standard taste" and "this product can be consumed after this date" when reach revealed that around 20% of food is thrown away just because consumer misinterpret the "Best before" label.

On the other hand, leftovers and food waste can be used for creating something beneficial. The simplest way is probably composting1: just add all food waste and some soil into a specific container, occasionally mix and after some weeks you have a compost that can act as great, natural fertilizer and soil enhancement element. Likewise, food waste can be used to create biogas, that in turn can be used for electricity production. It can even lead to the production of biofuel that can be used again on many occasions.

Figure 2: Quick Facts Households Food Waste

Source: UNEP, 2021.

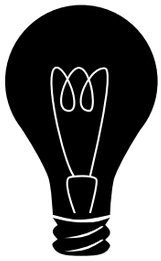
Overall, whether you're brewing coffee or watering a garden, each liter counts. Reducing shower time, favoring water-efficient appliances, and choosing less water-intensive foods shrinks your personal footprint—and the global water crisis.

Best Practice & Real Case Scenarios

- Too Good To Go (Europe) - App connects users with restaurants and stores selling surplus food at reduced prices—rescuing millions of meals. Youth ambassadors share rescue tips via Instagram: https://www.toogoodtogo.com/en-us

- Olio (Global) - Peer-to-peer food sharing app—neighbors list extra groceries for pickup. Local chapters organize monthly food-swaps and leftover socials: https://olioapp.com/en/

- Boroume (Greece) - Boroume represents the collective effort of a group of people to reduce food waste and at the same time to increase donated food in Greece: https://www.boroume.gr/en/



Summary and Key Implications

1. Your Impact in Brief:

- Eat Smarter: Plant-forward, seasonal, low-mile foods fuel your body and planet.
- Save Every Drop: Shorter showers, efficient tech, mindful menu choices shrink footprints.
- Waste Not: Plan, preserve, compost—turn scraps into soil gold or snacks.
- Support Sustainable Farming: Buy local, advocate green policies, join CSAs.

2. Top Benefits:

- Less waste, less pollution, healthier soils and waterways.
- Shared gardens

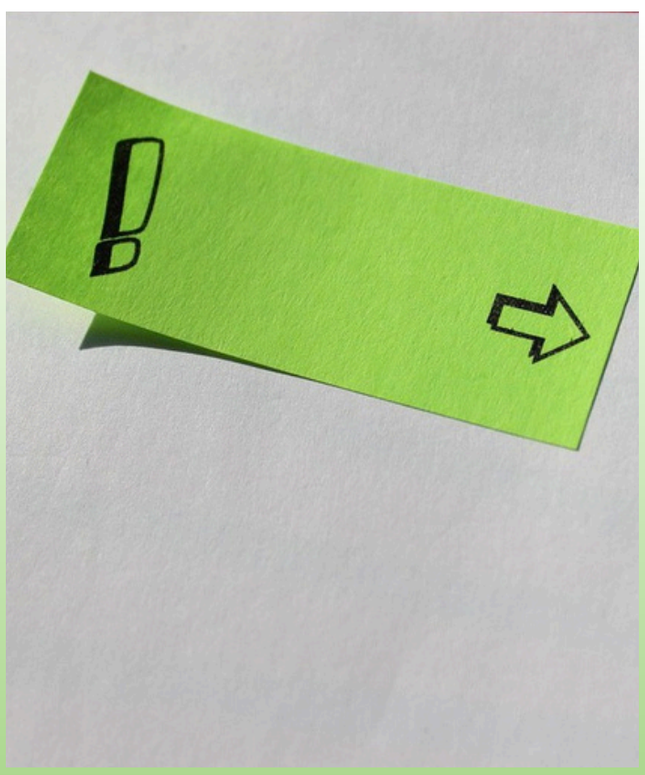
3. Next Steps:

- Launch a zero-food-waste challenge among friends.
- Track your weekly water footprint.
- Visit a local farm or food hub.

4. Challenges Ahead:

- Infrastructure gaps for sorting and wastewater recycling.
- Behavioral shifts required to break single-use habits.
- Policy inertia on water rights and agricultural subsidies.

Key Terms



- Food Miles: Distance food travels from farm to fork.
- Plant-Based: Diet centered on legumes, grains, nuts, fruits, and vegetables.
- Seasonality: Eating foods when they’re naturally ripe locally.
- Regenerative Agriculture: Practices that restore ecosystem health.
- CSA (Community Supported Agriculture): Consumers invest in farms for seasonal produce.
- Greywater Recycling: Reusing household wastewater for irrigation

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Youth Workers Corner n°7

Workshop n°1 Theme: Food Miles Detective - Understanding Personal Food Footprints and Making Informed Consumption Choices

Theme

- Understanding Personal Food Footprints and Making Informed Consumption Choices Purpose and Objective of the Workshop
- This activity helps young people understand the hidden environmental costs of their food selections by tracing where their food comes from and calculating the distance it travels. Through this activity participants will recognize how their food-related decisions directly impact carbon emissions, water usage, and resource depletion. The goal is to empower young people to become conscious consumers who make informed choices aligned with sustainability principles.

Target Group and Optimal Group Size Target Group:

- Young people aged 13–22 Optimal Group Size: 12–16 participants

Proposed Workshop Procedure and Methods Used

- Step 1: Hook & Context (10 minutes)
  - Begin by showing images of different foods (e.g., a banana, avocado, locally grown tomato, beef product) and asking: “Where do you think this food comes from? How did it get to your plate?” Facilitate a brief brainstorm about food origins. Introduce the concept of “food miles”—the distance food travels from farm to fork—and explain that transportation, storage, and production all carry environmental costs.

- Step 2: Food Audit Activity (15 minutes)
  - Divide participants into small groups (3–4 people). Provide each group with a list of common foods or actual product packages/labels showing country of origin. Groups investigate: Where is this food produced? How far has it traveled to reach your country? Is it in season? Is it processed or fresh? Create a simple chart categorizing foods as “local,” “regional,” “distant,” or “ultra-processed.”

- Step 3: Impact Calculation (10 minutes)
  - Using case studies, help groups understand the environmental impact of their foods. For example: “An avocado shipped from South America uses X liters of water and generates Y kg of CO2 versus a locally grown apple.” Introduce the concept of water footprints and carbon footprints in accessible terms. If possible provide internet access for young people to do some research on these issues.

- Step 4: Personal Reflection & Commitment (10 minutes)
  - Participants individually reflect on their own eating habits for one typical day. They record: What foods did I eat? Where did they come from? How many food miles? They can use a simple worksheet with illustrations if literacy varies. Guide them to identify one food they could swap for a local or seasonal alternative.

- Step 5: Action Planning (5 minutes)
  - Each participant commits to one small action: visiting a farmers’ market next week, checking where one food in their home comes from, or trying one seasonal, local alternative. Share commitments in pairs or with the group to build accountability.

Required Materials and Estimated Duration

- Materials:
  - Images of common foods (printed or digital)
  - Food product labels or packages showing country of origin (collected beforehand)
  - World map or globe (optional, to visualize distances)
  - Markers, colored pencils, and flipchart paper
  - Locally available food samples or photos (optional, for sensory engagement)
- Duration: 50–60 minutes
- Setup Time: 10 minutes

Final Discussion and Feedback

- Closing Circle (5 minutes)
- Bring the group back together. Ask:
  - "What surprised you most about where your food comes from?"
  - "What's one action you'll take this week based on what you learned?"
  - "What barriers might make sustainable food choices difficult, and how can we overcome them?"

- Youth Worker Debrief Notes:
  - Emphasize that sustainable eating is a journey, not perfection.
  - Acknowledge that access to local/sustainable food varies by location and income—this is a systemic justice issue.
  - Consider follow-up: creating a group "seasonal eating" calendar, planning a farmers' market visit, or inviting a local farmer to speak.
  - Use this as an entry point to discuss how corporate food systems and trade policies affect food access globally.

Workshop n°2 Theme: Tracking & Reducing Your Water Footprint

Theme

- Discovering Hidden Water Use and Building Water Conservation Habits

Purpose and Objective of the WorkshopPurpose and Objective of the Workshop

- This activity helps young people visualize the enormous amounts of water embedded in everyday products and practices—from showers to food. By calculating their personal water footprint and identifying waste, participants will understand water scarcity as both a personal and global justice issue. The workshop encourages behavior change (shorter showers, mindful consumption, supporting water-efficient agriculture) while exploring systemic solutions like greywater recycling and regenerative farming, positioning youth as advocates for water justice!

Target Group and Optimal Group Size

- Target Group: Young people aged 13–22
- Optimal Group Size: 12–16 participants

Proposed Workshop Procedure and Methods Used

- Step 1: Water Wake-Up Call (8 minutes)

Start with an impact statement: "It takes 2,700 liters of water to make one cotton t-shirt" or "A 5-minute shower uses 35–95 liters; a bath uses 250." Show a visual: a large water container and ask, "How many similar containers of water do you think you use in one day?" Collect guesses on a whiteboard. Reveal the reality (average 70–150 liters per person per day in developed countries, far less in water-scarce regions).
Introduce the concept of "water footprint"—total water in products we buy and consume.

- Step 2: Hidden Water Hunt (15 minutes)

Display images or bring samples of common items: a hamburger, an avocado, a pair of jeans, a liter of bottled water. Ask participants to estimate how much water was used to produce each. Provide fact cards with answers (e.g., "1 hamburger = 2,400 liters," "1 avocado = 700 liters," "1 pair of jeans = 7,600 liters"). Use this to illustrate that food and clothing carry massive "invisible" water costs. Introduce the concept of water-intensive vs. water-efficient foods and products.

Step 3: Personal Water Audit (12 minutes)
Provide a worksheet tracking daily water use:

- Morning shower/bath (duration and type of showerhead)
- Toilet flushing (number of times; note: modern toilets use 6–8 liters per flush)
- Drinking and cooking water
- Washing clothes and dishes
- Food consumption

Participants calculate their approximate daily water footprint.
Pair or small-group sharing: "How does your estimate compare to the group average?"

- Step 4: Reduction Challenge—Interactive Stations (15 minutes)

Set up 3–4 "Water Saving Stations" around the room. Each station features one action with visible impact:

- Station A: Shower Challenge

Display a timer and water container. Demonstrate a 5-minute shower vs. a bath. Participants can try timing themselves or a peer. Calculate: "If you cut shower time by 2 minutes daily, you save X liters per year."

- *Station B: Agricultural Water Wisdom*

Show an infographic about watering times (morning vs. noon) and water-efficient foods. Participants sort food images into "high water" vs. "low water" categories. Discuss: "A plant-based diet uses 53% less water than a meat-heavy diet."

- *Station C: Greywater & Recycling Innovation*

Display images or a simple diagram of greywater systems (shower water → toilet flushing, etc.). Discuss: "What water in your home could be recycled?" Participants brainstorm and record ideas on sticky notes.

- Step 5: Collective Commitment (5 minutes)

Bring the group together. Invite volunteers to share one action they'll commit to (shorter showers, choosing plant-based meals, supporting local farms, etc.). Write these on a flipchart titled "Our Water Warrior Pledges." Optional: take a group photo or post pledges in the youth center as a reminder.

Required Materials and Estimated Duration
Materials:

- Large water container (5–10 liters) or multiple smaller containers for visual impact
- Printed images of water-intensive items (hamburger, avocado, t-shirt, jeans)
- "Fact Cards" with water-use data
- "Personal Water Audit" worksheets
- Diagram or photos of greywater recycling systems
- Sticky notes, markers, flipchart

Duration: 55–60 minutes
Setup Time: 15 minutes (station preparation)

Final Discussion and Feedback
Reflection Circle (5 minutes)
Gather the group. Ask:

- "What was the most surprising fact about water use?"
- "What's one change you feel confident making? What's one that feels harder—why?"
- "Who has power to change water systems: individuals, businesses, governments, or all of us?"

Feedback & Follow-Up:
Distribute a simple feedback form or use a digital poll:

1. "I now understand water footprints" (1 (no idea) – 5 (great knowledge))
2. "I will change one behavior this week" (yes/maybe/no)
3. "What would help me save water?" (open response)

Youth Worker Debrief:

- *Systemic Perspective*:

Use this to discuss water justice: Why do some regions have clean water access while others face scarcity? Who profits from bottled water? What policies could help?

- *Community Action:*

Plan a group visit to a farmers' market to see water-efficient agriculture firsthand.

- *Measurement*:

Challenge youth to track their water use for one week and report back; celebrate progress collectively.

- *Advocacy*:

Discuss how youth can advocate for water-efficient practices in schools, youth centers, or local policies (e.g., installing low-flow showerheads in facilities).

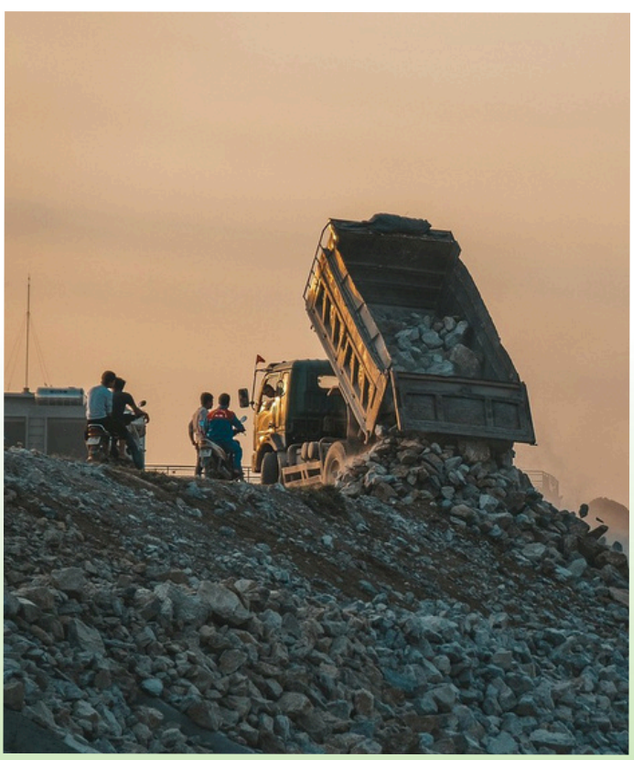
Video
Energy and Water Interwined

Fashion

Introduction

Imagine a world where your favorite t-shirt never ends up in a landfill. Where that dress you've outgrown finds a new life with someone else. Where fashions' impact on earth is not as harmful. This can come true in a world of circular fashion.

Fashion isn't just about looking good, it is one of the world's largest industries, shaping cultures, economies, and personal identities. But, its environmental and social impact is significant, with massive waste production, resource depletion, and labor exploitation. The fashion industry has a massive environmental footprint.



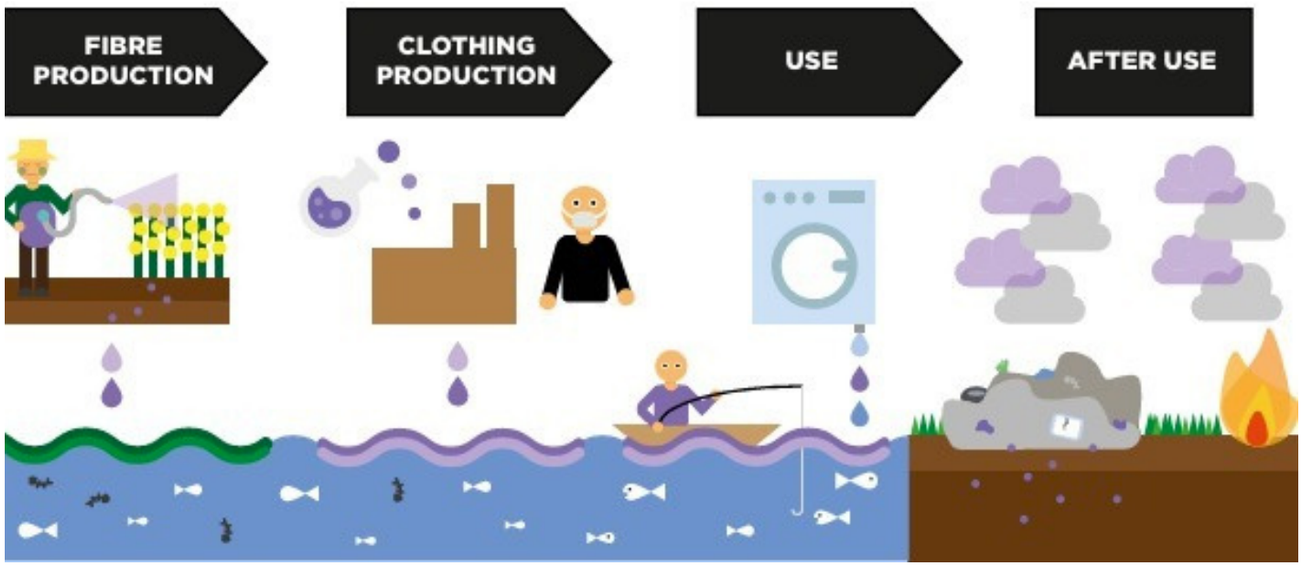
The way we currently make, wear and throw away clothes follows what's called a "linear model" - make it, use it, trash it. This approach is causing serious problems for our planet, from mountains of textile waste to polluted rivers and exploited workers. A circular economy in fashion offers an alternative approach. By designing out waste, extending the lifecycle of clothing, and promoting recycling, fashion can become more sustainable while still being innovative and creative.

In this chapter, we explore how circular economy principles can be applied to fashion, why it matters, and how young people and youth workers can engage in sustainable fashion practices.

The Environmental Impact of Fast Fashion

Let's face the fact: those cheap, trendy outfits that seem like such great deals come with hidden costs that our planet is paying for. Below is a breakdown of the major environmental issues caused by fast fashion.

Fig. 1: Redesigning Clothing Path

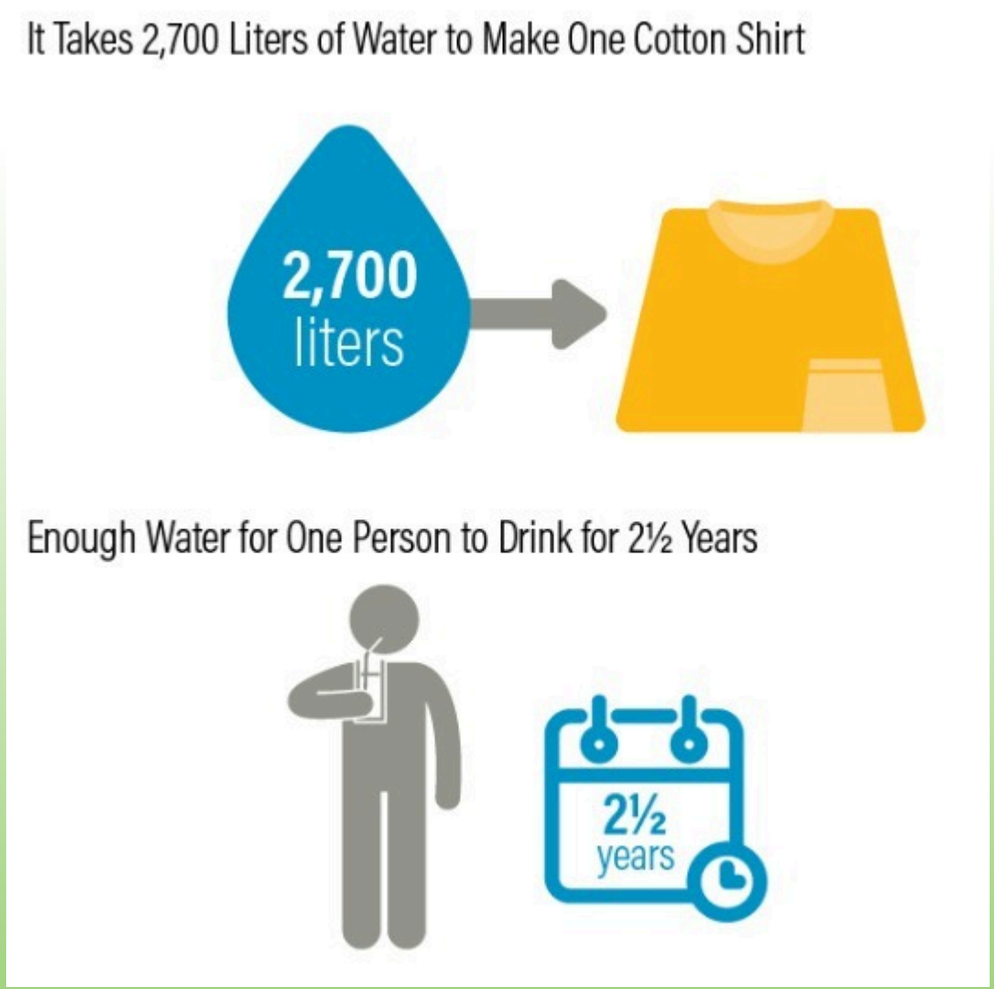


Source: Ellen MacArthur Foundation, 2020.

Water Consumption and Pollution

The fashion industry is incredibly thirsty, it is the second largest consumer of water worldwide. That cotton t-shirt you are wearing used about 2,700 liters of water to make, that is what one person drinks in 2,5 years!

Fig. 2: Water Requirements on Shirt Production



Source: World Resources Institute, 2023.

When clothes are dyed and treated, the process creates toxic wastewater that often gets dumped untreated into rivers and oceans. About 20 % of global water pollution comes from textile dyeing and treatment (World Resources Institute, 2023). These waters contain harmful chemicals like lead, mercury and arsenic that harm water living organisms and the humans who depend on these water sources. Another aspect is the use of pesticides in the cotton farming which also pollutes local water sources and at the same time affects biodiversity and human health.

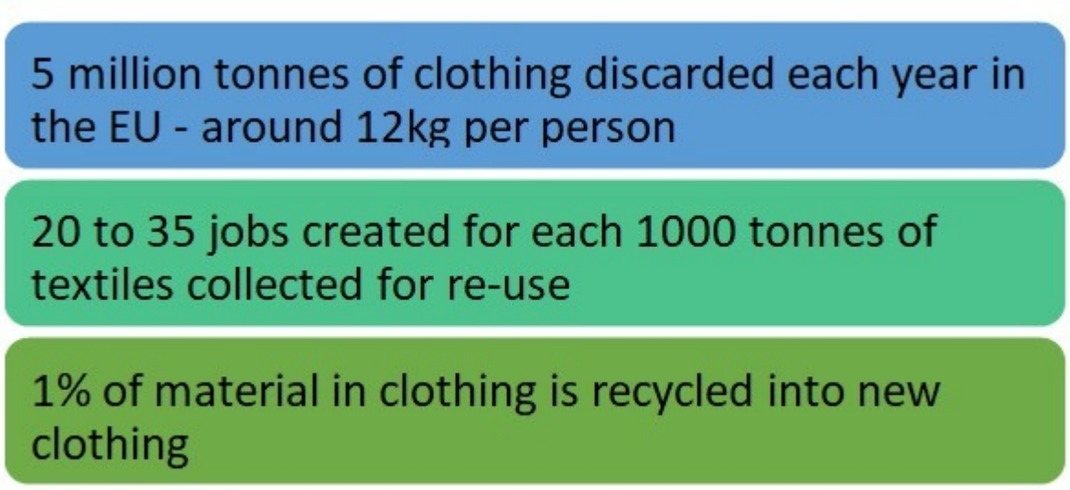
Carbon Footprint and Greenhouse Gas Emissions

When we talk about who has the greatest impact on climate change, the fashion industry is not always in focus. The industry contributes around 10 % of global carbon emissions, that is more than aviation and shipping combined. Much of fast fashion relies on synthetic materials like polyester, which is basically plastic made from fossil fuels. These materials not only generate high emissions during production but can take hundreds of years to decompose once thrown away. Upon this you can add the journey your clothes take before reaching you; raw materials grown in one country, processed in another, manufactured in a third country, and then shipped across the world to reach your store. All this transportation adds a huge carbon burden on each garment's footprint.

Textile Waste and Landfills

Every year we generate 92 million tons of textile waste globally. Much of it ends up in landfills in less developed countries or is incinerated, releasing more pollutants into the atmosphere .The "throwaway culture" means many garments are only worn a few times before being tossed aside. Fast fashion brands release new collections every few weeks rather than seasonally, encouraging constant consumption and throwaway.

Fig. 3: Facts about Clothing



European Commission, 2022.

Microplastic Pollution

Every time we wash synthetic clothes, like polyester or nylon, tiny plastic fibres (microplastics) wash down the drain. These fibres are too small to be filtered out by wastewater treatment plants and end up in our oceans. Each year, washing clothes releases about 500,000 tons of microplastics into the ocean, that is equivalent to 50 billion plastic bottles. These microplastic are consumed by marine animals and eventually end up in our food chain, posing risks to both wildlife and human health.

Deforestation

Materials like rayon, viscose and modal are often sourced from endangered forest ecosystems. Approximately 120 million trees are cut down annually to produce these fabrics, contributing to deforestation and loss of biodiversity.

Social and Ethical Issues

The environmental impacts are just one part of the story. Fast fashion is also linked to serious social consequences. Many workers face unsafe conditions, exposure to toxic chemicals, and wages so low they can't meet basic rights and needs. When we buy ultra cheap clothing, someone somewhere is paying the real price.

Principles of Circular Fashion

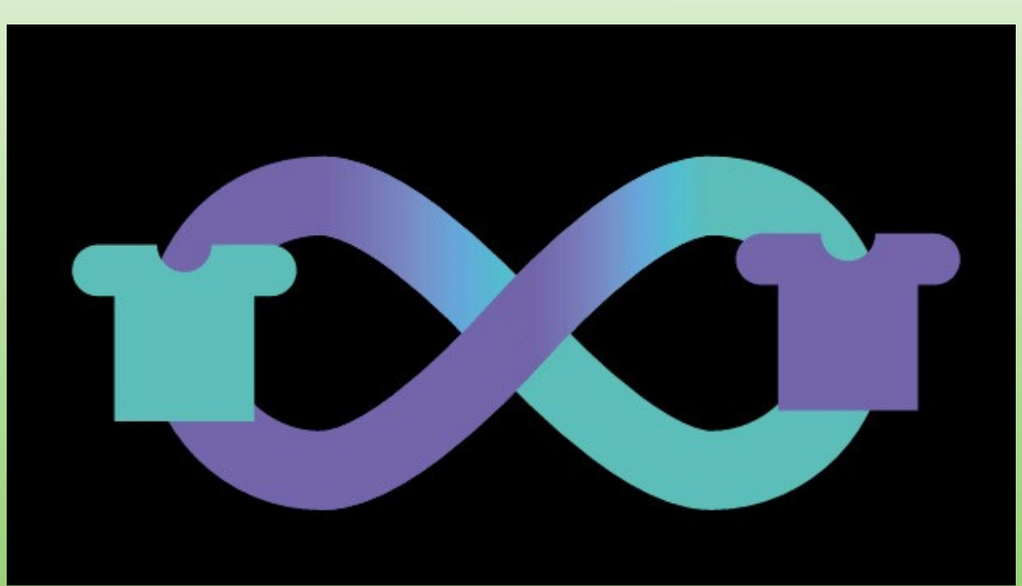
So what's the alternative to this wasteful system? Enter circular fashion, which is based on the idea of designing, producing, and consuming clothing in a way that minimizes waste, maximizes resources, and extends the life cycle of garments.

The key principles of circular fashion include:

1. Designing for Longevity - Imagine if clothes were designed to last for years, not weeks. In circular fashion, designers think about the entire lifecycle of a garment from the beginning. Some forward thinking brands are creating modular clothing that can be adapted or restyled as trends change. Others focus on versatile pieces that can be worn in multiple ways, reducing the need for more clothes. Another major challenge is kids clothing - as children outgrow their clothes very fast, before they can even be fully worn, some designers and brands are already thinking about ways to solve the need of constantly buying new clothes in larger sizes. Quite a few brands, such as Didriksons have come up with solutions of incorporating secret inseams into sleeves that can be cut to elongate the garments and make them wearable for longer periods of time. Another brand, Petit Pli, came up with an innovative solution to the sizing issue - they invented and applied groundbreaking material technologies to produce garments that literally grow with children, reducing water and carbon footprints and the need to keep buying new clothes, starting a sustainable childrenswear evolution.There are good examples of brands like Patagonia and Eileen Fisher who have led the way with repair services and take-back programs that extend the life of their products. But, as a consumer you need to be cautious of "greenwashing" - when brands claim to be sustainable without making meaningful changes to their business models (Greenpeace, 2021).
2. Reuse and Repair - We should embrace the value in what we already own. Second hand shopping has exploded in popularity, with platforms like Vinted, Depop and ThredUp making it easier than ever to buy and sell used clothes. Thrift stores and vintage shops offer unique finds with character and history. Upcycling is when we transform old garments into something new and exciting - think turning dad's old shirt into a trendy accessory or converting worn jeans into a stylish bag. Learning skills on how to repair is also making a comeback. The "visible mending" movement even celebrates repairs as a design feature, turning tears and holes into creative opportunities. The growing "Right to Repair" movement advocates for laws ensuring products can be fixed rather than tossed.

Remember the four Rs: Reduce what you buy, Reuse what exists, Repurpose what is worn out, and finally, Recycle what can not be saved any other way.

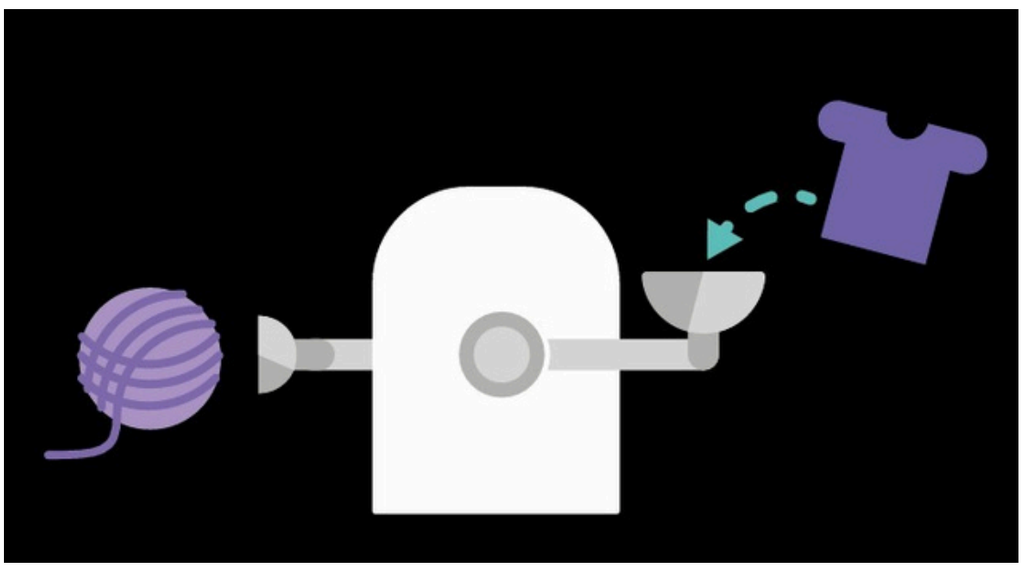
Figure 4: Fashion ´s Future



Source: Ellen MacArthur Foundation, 2020.

3. Recycling and Fiber Recovery - When clothes truly reach the end of their wearable life, recycling can give the materials a new purpose. Traditional mechanical recycling breaks down fibres like cotton and spins them into new yarn. Newer chemical recycling technologies are tackling the challenge of mixed fabrics, like polyester-cotton blends, which were previously difficult to recycle. Innovative companies are developing new alternatives like Renewcell's "Circulose, " which transforms discarded textiles into new fibers that major fashion brands can use in their collections. Researchers are also creating revolutionary materials from unexpected sources—mushroom leather, pineapple leaf fibers, and fabrics grown from bacteria offer sustainable alternatives to conventional textiles.

Fig. 4: Fashion ´s Future



Source: Ellen MacArthur Foundation, 2020.

4. Ethical Production - True sustainability must include social responsibility. Circular fashion is not just about materials and waste, it is also about the people who make our clothes. Fair wages and safe working conditions are essential components of a truly sustainable fashion industry. Transparency and traceability allow consumers to know where their clothes come from and under what conditions they were made.

Role of Consumers and Youth Engagement in Sustainable Fashion

You might be thinking, "What can I possibly do to change such a massive industry?" The truth is, young people are already leading the sustainable fashion revolution, and your choices have more power than you might realize:

1. Choosing Sustainable Brands - Every purchase is a vote for the kind of world you want to live in. Before buying something new, ask yourself: Do I really need this? How many times will I wear it? Will it last? Was it made ethically? Support brands that align with your values - those using sustainable materials, ensuring fair working conditions, and designing for longevity.Use apps and websites that rate brands on their sustainability credentials, like Good On You or the Fashion Transparency Index, to make informed choices. Social media has given consumers a powerful tool to influence fashion brands. By using platforms like Instagram, TikTok, and X, they can call out brands for greenwashing, demand transparency, and promote ethical alternatives.

2. Embracing Second-Hand and Circular Fashion - Before buying new, exploring second-hand stores, vintage shops, or online marketplaces like Depop or Vinted can uncover unique pieces with character and history. Organize clothing swaps with friends or in your community—it's a fun way to refresh your wardrobe without buying new items. For special occasions, consider renting outfits instead of buying something you'll only wear once. Rental services for everything from prom dresses to designer handbags are becoming increasingly popular.

3. Get Creative with What You Have - Learn basic repair skills to extend the life of your clothes - sewing on buttons, fixing small tears, or patching holes can be surprisingly satisfying. Try upcycling projects to transform clothes you no longer wear - cut jeans into shorts, turn t-shirts into tote bags, or add embellishments to update plain items, this encourages personal expression. Experiment with different combinations of what you already own instead of buying new pieces. Challenge yourself to create multiple outfits from a limited number of items (this is called a "capsule wardrobe").

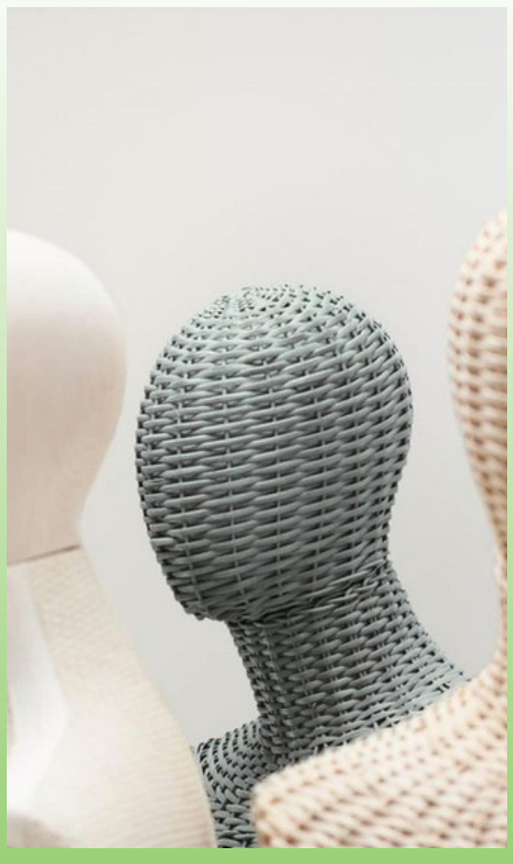
4. Supporting Legislation and Industry Regulation - Beyond individual actions, young people can engage in activism and policy advocacy to push for stricter regulations on fast fashion. By supporting initiatives that promote extended producer responsibility (EPR), ethical supply chains, and circular economy policies, they can contribute to systemic change. Youth-led organizations and climate movements are increasingly vocal about the need for a sustainable fashion industry, pressuring policymakers to take action.

5. Educating and Inspiring Others - Education is a key driver of change, and young people can play an important role in spreading awareness about sustainable fashion. Whether through social media content, school projects, workshops, or peer discussions, youth can inspire their communities to adopt more responsible fashion habits. By sharing knowledge on slow fashion, the impacts of fast fashion, and sustainable alternatives, they contribute to a more informed and conscious society.

Best Practices and Real Case Scenarios

The EU Strategy for Sustainable and Circular Textiles

In March 2022, the European Commission adopted the EU Strategy for Sustainable and Circular Textiles as part of the European Green Deal. This groundbreaking initiative aims to transform how textiles are produced and consumed across Europe.



Key Objectives of the Strategy:

1. Making Textiles More Durable, Reusable, and Recyclable:
   - Introduces Ecodesign requirements to ensure textiles are long-lasting, repairable, and recyclable.
   - Targets fast fashion reduction and encourages sustainable production and consumption.

2. Extended Producer Responsibility (EPR):
   - Producers will be responsible for the entire life cycle of textiles, including waste management.
   - Establishes mandatory collection, sorting, reuse, and recycling systems.

3. Reducing Microplastics and Hazardous Chemicals:
   - New regulations to limit microplastic release from synthetic textiles.
   - Stricter chemical use policies for safer production processes.

4. Combating Overproduction and Overconsumption:
   - Discourages the fast fashion model and promotes sustainable business practices.
   - Supports new business models like rental, resale, and repair services.

5. Promoting Fair and Ethical Supply Chains:
   - Ensures that textile production respects human rights and labor standards.
   - Encourages transparency and traceability in supply chains.

6. Encouraging Innovation and Investment
   - Boosts research in circular textile technologies (e.g., fiber-to-fiber recycling).
   - Supports businesses in adopting sustainable practices through funding programs.

These changes will affect everyone in Europe—from large fashion brands that must redesign their products and take responsibility for waste, to consumers who will have better access to sustainable options and repair services.

Local and Grassroots Initiatives

In cities like Berlin, Amsterdam, and Copenhagen, repair cafés offer free help fixing clothes instead of discarding them. These community spaces not only reduce waste but also build skills and social connections.

The Fashion Revolution movement has inspired thousands of young people to question "Who made my clothes?" and demand greater transparency from brands about their manufacturing practices. Innovative startups are creating closed-loop systems—like the Orange Fiber project in Italy, which transforms citrus waste from juice production into biodegradable fabrics used by luxury brands.

Young designers are pioneering sustainable fashion, using recycled materials and zero-waste pattern cutting to minimize environmental impact while creating beautiful, desirable clothing.

1. Celje Youth Centre Saturday's Thrift Market - Celje youth centre has implemented an example of a thrift shop in August 2024. We have set up a thrift clothing event on a Saturday morning on a local municipality market. The event was set up that people could register and bring their own clothes and show, which then they sold the clothes in the market. This is how we supported the reuse of old clothes with a community exchange among other people and talked about sustainability in Fashion and Circular Economy.

2. Dan v rabljenih oblačilih (Day in Second-Hand Clothes) – Slovenia - Held annually on April 23rd, this event encourages individuals and organizations across Slovenia to wear second-hand clothing to raise awareness about sustainable fashion practices. Activities include clothing swaps, workshops on upcycling, and social media campaigns promoting the benefits of clothing reuse.

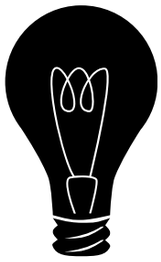
3. KNOF's Stara Šola Boutiques – Slovenia - KNOF, a Slovenian social enterprise, operates several "Stara Šola" (Old School) reuse boutiques across the country. These boutiques collect donated clothing, which is then sorted, refurbished, and sold, promoting the circular economy and reducing textile waste. They also host workshops and events focused on upcycling and sustainable fashion.

4. Veras – Denmark - Based in Copenhagen, Veras is a multi-platform initiative that facilitates clothing reuse and upcycling. They operate an online webshop, host weekly clothing markets, and run a flagship store where individuals can swap and purchase second-hand clothing. Veras aims to make sustainable fashion accessible and mainstream

5. Upcycling Fashion Week at Stüdio Emmaüs – France - Held in Paris, this event features free shopping experiences, exhibitions, and creative workshops focused on upcycling. Participants can engage in activities like making cushion covers, jewelry repair, and embellishing worn garments, all aimed at promoting the reuse and transformation of existing textiles.

6. Revive Couture – Austria - Organized by Circular Wien, Revive Couture is an upcycling fashion show held in Vienna. The event showcases designers who create new garments from recycled materials, highlighting the creative potential and environmental benefits of upcycled fashion.

These events and initiatives play a crucial role in promoting sustainable fashion by encouraging the reuse and upcycling of clothing, thereby reducing waste and environmental impact.



Summary and Key Implications

Fashion and circular economy principles can coexist, providing solutions to the environmental and ethical challenges of the industry. Key takeaways include:

- The fashion industry's current linear model is unsustainable.
- Circular fashion encourages longevity, repair, resale, and ethical production.
- Young people and youth workers can drive change through awareness, consumption choices, and community initiatives.
- Businesses and policymakers play a critical role in promoting sustainability through regulation and innovation.

Despite challenges like consumer habits and economic barriers, the transition to circular fashion is essential for a more sustainable future. Circular fashion offers significant environmental and social benefits by promoting sustainability and reducing waste. One of its key advantages is minimizing textile pollution, as fewer discarded garments end up in landfills. By extending the lifespan of clothing through reuse, recycling, and upcycling, circular fashion also lowers the carbon footprint, reducing emissions associated with fast fashion production.

Beyond environmental benefits, circular fashion supports local economies by creating jobs in repair, rental, and resale industries. This shift not only fosters economic growth but also encourages mindful consumption, helping people prioritize quality over quantity and make more conscious purchasing decisions. Ultimately, embracing circular fashion leads to a more sustainable and responsible approach to clothing production and consumption.

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Youth Workers Corner n°8

Workshop n°1 Theme: Circular Wardrobe Challenge

Workshop Overview
This 90-minute workshop introduces young participants to the environmental and social impact of fast fashion and explores sustainable alternatives through circular economy principles. Participants will reflect on their clothing consumption habits, learn about circular fashion solutions, and collaboratively design a 'circular wardrobe' concept that promotes sustainability and creativity.

Learning Objectives
- Understand the environmental impact of fast fashion and consumer culture.
- Explore key principles of circular fashion: reduce, reuse, repair, recycle.
- Reflect on personal and collective clothing consumption habits.
- Develop teamwork, communication, and critical thinking skills.

Theoretical Introduction (for Facilitator)
The facilitator should begin by explaining the difference between linear and circular fashion systems, referencing the CIRCLES curriculum. Emphasize that the fashion industry contributes nearly 10% of global carbon emissions and consumes vast amounts of water and energy. Circular fashion, on the other hand, seeks to extend product lifecycles, minimize waste, and promote ethical production. Use visuals or slides showing the fashion lifecycle and introduce terms such as 'fast fashion', 'upcycling', and 'ethical brands'.

Recommended short video introduction (QR code provided): Ellen MacArthur Foundation – "A New Textiles Economy: Redesigning Fashion's Future".

Step-by-Step Implementation (90 minutes)
- Step 1 – Welcome and Icebreaker (10 min)

Facilitator greets participants and sets the tone with an engaging question such as: "How many items of clothing are you wearing today that you bought in the last 6 months?" Allow brief discussion. Introduce the workshop goal: to rethink our relationship with clothes.
- Step 2 – Theoretical Input (15 min)

Show a short 3–4 minute video (Ellen MacArthur Foundation or Fashion Revolution) via QR code. Then, summarize the key points about the fashion industry's impact. Use posters or slides to highlight statistics: e.g., '1% of textiles recycled', '2,700 liters of water per T-shirt'. Encourage participants to reflect on these facts.
- Step 3 – Visual Mapping of Fashion Lifecycle (15 min)

In small groups, participants draw or digitally map a garment's journey: from production to disposal. Ask: Where does it come from? What resources are used? What happens after it's thrown away? Discuss where circular principles could fit into the chain.
- Step 4 – Circular Wardrobe Challenge (40 min)

Each group designs a 'Circular Wardrobe' on flipchart paper or in Canva/Miro. They choose 6–8 clothing items that represent sustainable fashion choices (e.g., second-hand, repaired, upcycled, rented, ethically made). They name their wardrobe and create a slogan promoting mindful fashion. Encourage creativity—drawings, collage, digital design.

- Step 5 – Presentation and Reflection (10 min)

Groups present their wardrobes. Facilitator leads reflection using guiding questions: What surprised you most? What changes could you make personally? How can youth influence fashion culture? Conclude by connecting to EU initiatives like the EU Strategy for Sustainable and Circular Textiles.

Materials Needed

- Flipcharts or large paper sheets
- Markers, scissors, glue, magazines for collage
- Laptop/projector for videos
- Internet access or printed QR codes
- Canva or Miro access (optional for digital version)
- Reflection sheets

- Accessibility & Adaptation Tips
- Use printed visuals or tactile materials for participants with visual impairments.
- Provide subtitles or transcripts for videos.
- Allow verbal rather than written reflection for participants with literacy challenges.
- Adjust group sizes for mobility or sensory needs.
- For online delivery, use digital whiteboards (Miro, Padlet).

Digital Tools & QR Codes

- Ellen MacArthur Foundation – 'A New Textiles Economy' video: https://youtu.be/zCRKvDyyHmI
- Fashion Revolution – 'Who Made My Clothes?': https://www.fashionrevolution.org/
- Podcast: Conscious Chatter – 'Rethinking Fashion's Future': https://consciouschatter.com/

Reflection & Evaluation

- After the workshop, distribute short reflection sheets or use Mentimeter. Suggested questions:
  - What new fact or insight changed your perception of fashion?
  - What can you do differently when buying clothes next time?
- How can we as youth promote circular fashion in our communities?

Facilitator Tips

- Keep the discussion positive and empowering – focus on creativity and possibilities rather than guilt.
- To extend the session to 120 minutes, add a peer feedback round after presentations or invite a local sustainable fashion entrepreneur for Q&A.
- Combine with a practical follow-up (e.g., organizing a clothing swap or mini fashion upcycling fair).

Workshop n°2 Theme: Upcycle Lab

Workshop Overview
This 90-minute hands-on workshop immerses participants in the concept of upcycling and sustainable fashion practices. Through creative reuse of old garments, participants explore how design, repair, and resourcefulness can extend the life cycle of clothing and reduce textile waste. They will gain an understanding of circular fashion principles by turning old clothes into new items with personal and environmental value.

Learning Objectives
- Apply principles of circular fashion through practical upcycling.
- Enhance creativity and problem-solving skills.
- Understand the environmental impact of textile waste and benefits of reuse.
- Promote sustainable consumer behavior and community sharing.

Theoretical Introduction (for Facilitator)
Begin by introducing the concept of upcycling as one of the key pillars of circular fashion. Explain how it differs from recycling: upcycling adds value by creatively transforming materials into higher-quality or functional items. Reference examples from the CIRCLES curriculum, such as KNOF's Stara Šola reuse boutiques in Slovenia, and international initiatives like the Fashion Revolution movement promoting repair and reuse. Highlight that each year 92 million tons of textiles end up in landfills globally, yet simple repair and redesign practices can make a huge difference.

Step-by-Step Implementation (90 minutes)
- Step 1 – Introduction & Inspiration (10 min)

Facilitator welcomes participants and introduces the workshop aim: transforming old clothes into something new. Show short video 'Visible Mending – Turning Tears into Art' or images of upcycled fashion. Briefly discuss: 'Why is repair creative and sustainable?'
- Step 2 – Demonstration & Skill Briefing (10 min)

Demonstrate simple techniques: patching, sewing on buttons, cutting shirts into tote bags, or embellishing jeans. Emphasize safety and creativity. Provide examples of visible mending or upcycled design.
- Step 3 – Upcycle Lab (50 min)

Participants work individually or in pairs. Encourage experimentation with color, texture, and shape. Youth workers circulate to assist with technical skills or creative ideas. Optional: play background music or create a relaxed atmosphere to support creativity.
- Step 4 – Mini Exhibition & Reflection (20 min)

Participants display their creations. Facilitate a walk-around gallery where they explain their concept and what they learned. Discuss how upcycling can reduce waste and inspire community initiatives such as clothing repair cafés or swap events.

Materials Needed

- Old clothes (t-shirts, jeans, jackets)
- Sewing kits: needles, threads, scissors, fabric glue
- Buttons, patches, ribbons, and decorations
- Iron-on patches or paint markers
- Tables covered with protective sheets
- Laptop/projector for videos
- Optional: portable sewing machine
- Waste bin for textile scraps

Accessibility & Adaptation Tips

- Provide adaptive sewing tools with larger grips for motor impairments.
- Ensure good lighting and visual contrast for low-vision participants.
- Offer non-sewing options (fabric glue or iron-on patches).
- Provide video captions and visual demonstrations.
- For participants with hearing difficulties, include written step-by-step instructions.
-

Digital Tools & QR Codes

- YouTube: Visible Mending – Turning Tears into Art: https://youtu.be/_oB3L4PZz7E
- KNOF Stara Šola Boutique (Slovenia): https://knof.si/en/o-nas/
- Podcast: Wardrobe Crisis – 'Upcycling: The New Cool' https://thewardrobecrisis.com/podcast
- Canva template for idea sketching: https://www.canva.com/templates/fashion-design-sketchbook/

Reflection & Evaluation

Suggested reflection prompts:

- What did you create and why?
- How did it feel to repair or repurpose something instead of throwing it away?
- What message would you share with others about upcycling?
- How can communities encourage more reuse and repair initiatives?

Facilitator Tips

- Maintain a supportive, non-judgmental environment – creativity grows from experimentation.
- Play background music to create a relaxed, collaborative atmosphere.
- To extend to 120 minutes, include a peer feedback round or organize a mini fashion show to present upcycled designs.
- Partner with local reuse centers or sewing groups for future collaborations.
- Encourage photographing the process to share on social media using #CircularFashion or #CIRCLESproject.

Podcast
Circular Fashion by MCC

Video
Extra Material Fashion - Circular Economy

STORY MAP

Fashion in the Circular Economy

Characters

Setting

The global fashion industry – from shopping malls and online stores to second-hand shops, repair cafés, and community swap events.

Beginning

Fashion became fast and cheap. People bought clothes quickly and threw them away after only a few wears. Factories produced massive amounts of textiles, using water, energy, and chemicals.

M iddle

Communities and innovators started noticing the waste problem. Repair cafés appeared, young designers explored upcycling, and second-hand fashion gained popularity. Consumers began to question fast fashion and looked for alternatives.

End

Fashion starts shifting toward a circular model: longer product life cycles, shared wardrobes, renting clothes, and recycling textiles. Young people become agents of change by choosing sustainable options.

Problem

Fast fashion creates pollution, waste, and poor working conditions. Clothes are produced too fast, worn too little, and discarded too soon.

Solution

Circular fashion: reuse, repair, rent, and recycle. Sustainable materials, ethical production, and community-driven solutions (swaps, thrift stores, DIY upcycling) reduce waste and give clothes a longer life.

Housing in the Curcular Economy

Introduction

Housing is something everyone needs, but the way we currently build homes puts a huge strain on our planet. We take materials, build, use them, and then tear buildings down, which creates a lot of waste. Circular economy thinking gives us a smarter, greener way to build homes. By reusing buildings, choosing better materials, and being more innovative, we can protect the environment and still meet our housing needs.

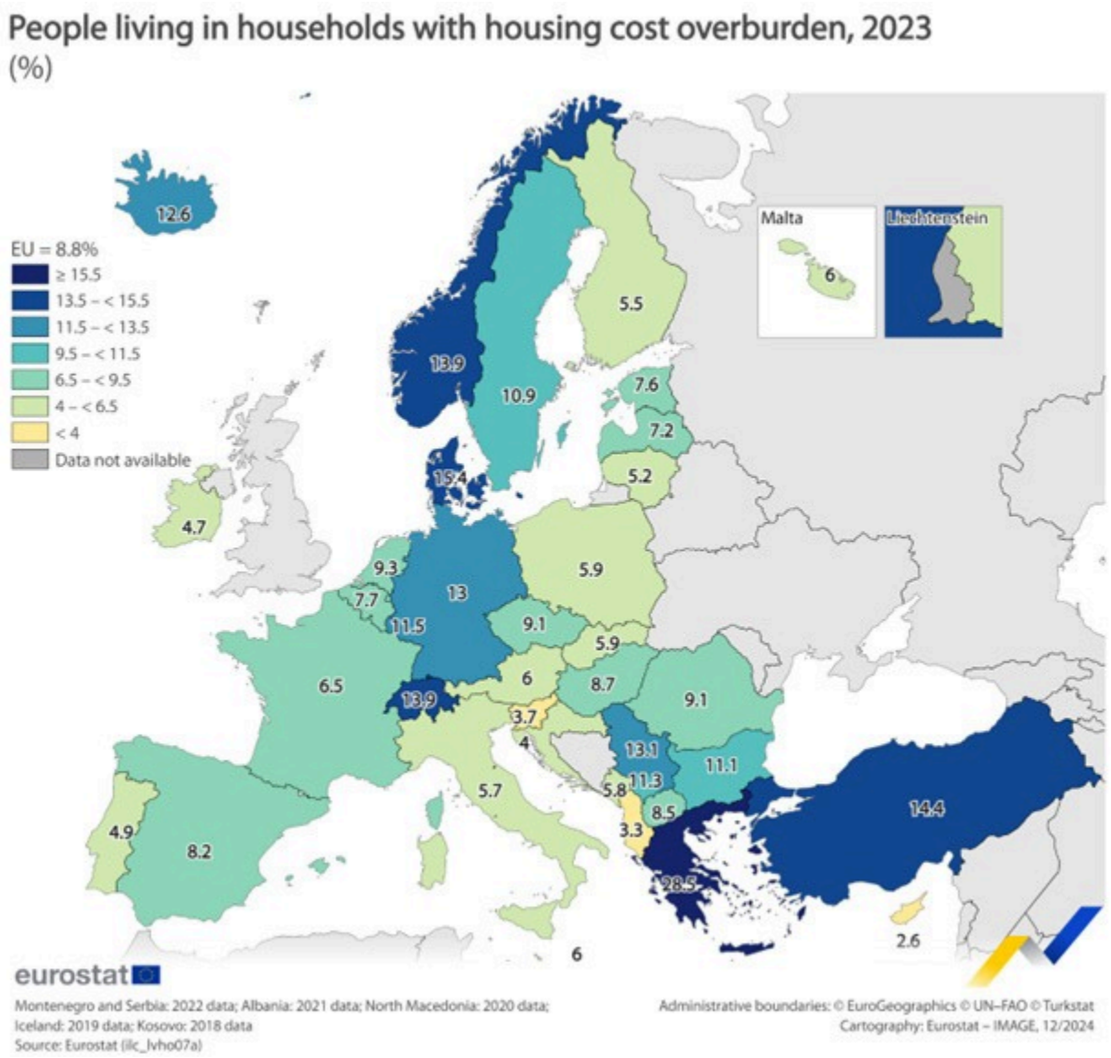
Fig. 1: Green way to build homes

Source: Image created by AI (Canva DreamLab).

The State of the Housing in Europe 2023

Housing in Europe is facing serious challenges. Homes are too expensive, there aren't enough of them, and it's getting harder to meet environmental goals. Reports from Housing Europe and Eurostat highlight rising costs, big differences between countries, and a major need for energy-friendly renovations. Many people across Europe, around 50 million, are spending more than 40% of their income on housing. That's just not sustainable. Young people, low-income workers, and vulnerable groups are especially affected. In some countries like Greece and Germany, rents are particularly high. Meanwhile, Eastern Europe still has high homeownership, but Western and Northern Europe are more mixed between renting and owning.

Fig. 2: Households with overburden costs in EU



Source: Eurostat, 2023.

Since 2010, home prices in the EU rose by 47% - and in some places much more. Estonia saw prices nearly triple! At the same time, cities are seeing more people move in, along with investors and short-term rentals like Airbnb, pushing prices even higher. With climate change and high energy bills in mind, the EU is making energy-efficient homes a top priority. The Green Deal and Renovation Wave aim to cut building emissions by over half by 2030. But there's a challenge: many European homes are old and inefficient, and fixing them requires money that many people don't have.

The State of the Housing in Europe 2023

Sustainable housing starts with better materials. Traditional options like concrete and steel are hard on the environment. Instead, circular homes use materials like responsibly harvested wood, hempcrete, bricks made from mushrooms, and recycled materials. They're greener, stronger, and more efficient.

Fig. 3 Building materials comparison

Source: Ellen MacArthur Foundation, 2020.

Several EU policies support this transition. The EU Green Deal aims to make Europe climate- neutral by 2050, focusing on building materials and circular principles. The Construction Products Regulation (CPR) ensures building materials meet sustainability standards and promotes recycling. Certification systems like Leadership in Energy and Environmental Design (LEED) also encourage sustainable material use by setting high standards for energy efficiency and environmental performance.

Energy Efficiency and Renewable Energy Integration

Buildings in the EU use about 40% of all energy consumed, so designing them to be efficient makes a big difference. Using smart designs and clean energy sources like solar panels or geothermal systems can make homes energy- positive, meaning they create more than they use.

The Energy Performance of Buildings Directive (EPBD) sets mandatory performance requirements for new and existing buildings, including renewable energy integration and efficient construction methods. The Renewable Energy Directive (RED II) promotes clean energy across sectors by setting binding targets and encouraging energy-efficient building development.

Adaptive Reuse and Renovation

Instead of tearing down old buildings, why not give them new life? Turning empty factories into homes or unused offices into shared living spaces saves resources and keeps neighborhoods alive. This also helps preserve local history and reduces waste.

Fig. 4: Sustainable Alternative of New Constructions Projects

Source: youRhere, 2022.

Modular and Prefabricated Housing

Modular homes (built in pieces and assembled on-site) fit perfectly with circular economy goals. They're flexible, efficient, and easy to upgrade. They also waste less during construction and can change with a family's needs over time. The EU Construction 4.0 initiative supports advanced technologies like modular construction, 3D printing, and automation in building, leading to more efficient and sustainable housing production.

Fig. 5: Modular Houses Projections

Source: Image created by AI (Canva DreamLab)

Waste Management and Recycling in Construction

Construction creates a lot of waste, but circular thinking turns that waste into new opportunities. Buildings can be designed for easy disassembly, with parts that can be reused. Cool technologies like 3D printing with recycled materials are helping move toward zero waste.

EU policies that drive waste management in construction include:

1. The Waste Framework Directive - This directive set up the principles of waste management and recycling in the EU, promoting the circular economy by promoting the reuse of materials from construction and demolition

2. The EU Construction and Demolition Waste Protocol - This protocol promotes strategies for reducing waste in construction. How to reuse materials and how to deconstruction of a building rather than demolition.

Social and Economic Impact

Circular housing doesn't just help the planet – it helps people too! Recycled and modular materials can lower housing costs, and community-led housing projects keep money local. Plus, this shift creates green jobs in construction and renovation. The EU Social Economy Action Plan highlights the role of social enterprises, including housing cooperatives, in promoting sustainable development and creating social value in local communities.

Statistical Data: EU Countries Leading in Sustainable Housing

As part of the EU's commitment to sustainability and carbon neutrality by 2050, several member states have made significant progress in integrating circular economy principles into their housing and construction sectors. Below are some key statistics and examples of countries actively advancing circular housing.

1. Denmark - Denmark has become a leader in sustainable housing, with Copenhagen being a prime example of circular practices in the housing sector. According to the Danish Ministry of Housing:

- Over 40% of new residential buildings in Copenhagen are designed with circular economy principles, such as using repurposed materials and promoting energy-efficient designs.
- The city aims for 100% renewable energy in housing by 2030, with widespread use of solar panels, geothermal heating, and efficient insulation.
- Copenhagen's Resource Rows – a residential project built entirely from repurposed bricks, windows, and doors sourced from demolished buildings.
- Living Places Copenhagen, a residential architecture experiment, is also an exhibit that demonstrates how sustainable buildings with a three times lower carbon footprint than presently acceptable and a first-class indoor climate can be developed.

2. Sweden - Sweden is another EU leader in circular housing, particularly in its use of renewable and sustainable materials. Data from the Sweden Green Building Council highlights that:

Fig. 6: Copenhagen´s Resource Rows

Source: Stirworld, 2023.

- Nearly 80% of new construction projects in Sweden incorporate recycled materials, reducing waste generation and carbon footprints.

Fig. 7: Copenhagen´s Resource Rows

Source: Stirworld, 2023.

- Swedish policies encourage the use of timber, including cross-laminated timber (CLT), which is 10 times more efficient in carbon storage than traditional concrete.
- Sweden has also implemented a national recycling rate of construction materials to approximately 95%, setting an ambitious benchmark for other countries.

3. The Netherlands - The Netherlands is known for its pioneering efforts in circular construction. The country's commitment to a circular economy is reflected in:
- Circular Economy Targets: the Dutch government aims to achieve a 50% reduction in construction waste by 2050.
- Circular Housing Projects: cities like Amsterdam have seen a rise in modular and prefabricated housing, with over 30% of new residential projects incorporating circular design principles.

Fig. 8: Sodra - Cross-laminated timer

Source: Stirworld, 2023.

• Superuse Studios, a leading architectural firm in the Netherlands, has demonstrated the potential of reclaimed materials, using them in more than 15 large-scale projects to reduce waste and carbon emissions.

Here you can see a transformation of a former community centre into 19 residential units with collective living and neighbourhood functions in Den Bosch. It's the first residential complex made from residual materials. This project shows what is already possible with circular construction (e.g. The CO2 savings are 70% compared to the current building standard). 4. Germany - Germany's construction sector is embracing sustainability with substantial

Fig. 9: Superuse Studios

Superuse Studios, 2025.

4. Germany - Germany's construction sector is embracing sustainability with substantial government backing. Key statistics include:

- The German Energy Efficiency Strategy aims for a 40% energy reduction in the housing sector by 2030 compared to 2019 levels.
- Buildings in major cities like Berlin are being retrofitted with energy-efficient materials and renewable energy solutions.
- Germany's KfW Bank is financing green housing projects, with a reported increase of 20% in loans for sustainable construction since 2020.

Finland - Finland has integrated circular economy principles in both policy and practice. The Finnish Circular Economy Roadmap highlights that:

- Finland has set a target to reuse or recycle 95% of construction and demolition waste by 2035 (Finnish Ministry of the Environment, 2021).
- Helsinki's Circular Economy Project focuses on energy-efficient housing designs and sustainable material use, making the city a role model in integrating circular housing principles (City of Helsinki, 2023).

Policy Recommendations and Future Outlook

To address Europe's housing problems, policymakers will have to focus on: 1. Increasing Investment in Social and Affordable Housing:

- Expanding public housing initiatives to meet growing demand.
- Implementing stronger rent control policies in high-cost urban areas.

2. Encouraging Sustainable Housing Solutions:

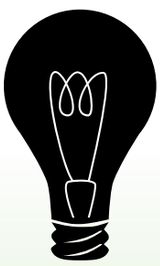
- Providing incentives for energy-efficient renovations.
- Supporting sustainable and circular housing models to reduce construction waste.

3. Regulating the Rental Market:

- Addressing the impact of short-term rentals (e.g., Airbnb) on local housing markets.
- Ensuring rental contracts provide stability and affordability.

4. Boosting Housing Supply

- Simplifying construction regulations to speed up new developments
- Increasing funding for cooperative and community-led housing initiatives.



Summary and Key Implications

Circular housing offers a chance to fundamentally rethink how we build and live sustainably. The benefits are clear: reduced environmental impact, lower costs through material reuse, increased energy efficiency, and more resilient buildings. However, significant challenges remain, including policy barriers, high upfront costs, and the need for industry-wide transformation. Youth and youth workers can play a vital role in shaping the future of sustainable housing by raising awareness and driving innovative approaches to these challenges.

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Podcast
Circular Economy and Housing

Video
MCC Presents their sustainable hostel

Youth Workers Corner n°9

STORY MAP

Housing in the Circular Economy

Characters

Setting

Urban neighborhoods, construction sites, households, and community living spaces where housing solutions are designed, built, used, and maintained.

Beginning

Traditional housing relied on resource-intensive construction materials and inefficient energy systems. Houses consumed large amounts of energy and produced significant waste.

M iddle

New approaches emerged: green building materials, modular design, and energy-efficient technologies. Communities began experimenting with shared housing, co-housing projects, and better insulation. Repair and renovation became more valued than demolition.

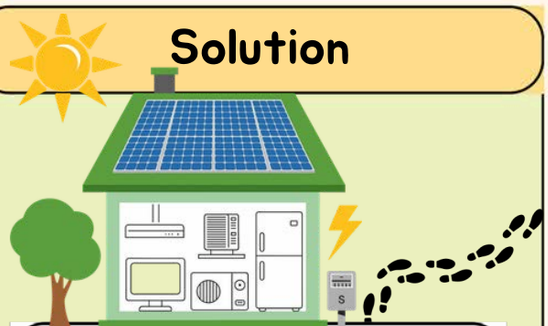
End

Housing shifts toward circular solutions: buildings designed for reuse, renewable energy integration, water recycling systems, and community-driven housing projects. Homes become more sustainable, affordable, and resilient.

Problem

Conventional housing is resource-heavy, generates waste, and often locks people into unsustainable lifestyles. Energy inefficiency and poor design add to climate and social challenges.

Solution

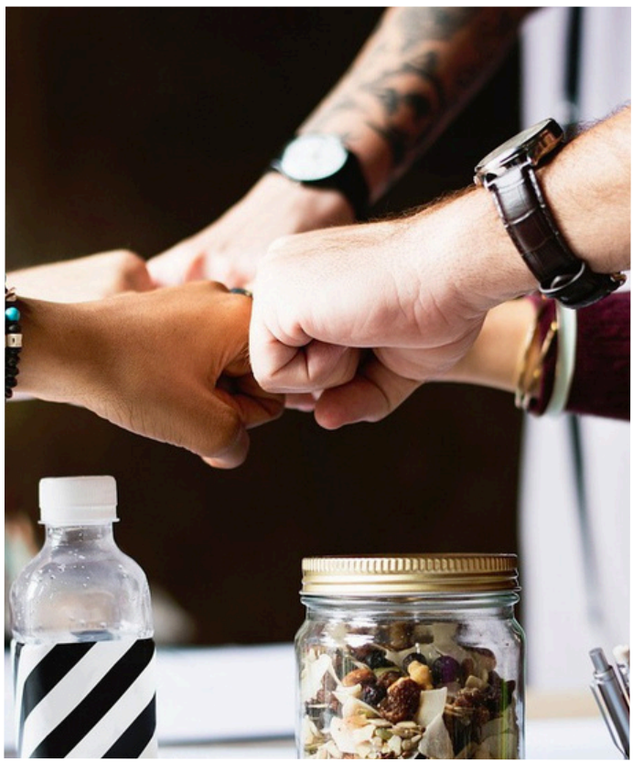


Circular housing: designing for durability, repair, and adaptability. Using renewable energy, recycled and bio-based materials, and encouraging shared living models. Renovation, reuse of materials, and smart energy systems reduce the ecological footprint of homes.

Community Activities

Introduction

The transition from linear to circular economy will not just happen one day like with a magic wand. The whole society has to join forces into changing the mindset, practices and principles of people, companies and governments. The transition will need changes in many aspects of our lives and how businesses and countries work. In this chapter we will focus on community activities from different types starting from municipality-led studies and circular economy applications in cities, going through local initiatives and covering also the shift from products to services. We will present to you just a small amount of the initiatives that are happening across the EU and the world, but we hope this inspires you to do something in your own home, city or even country.



Municipality-led circular economy case studies

During the Climate-KIC's Circular Cities Project C40 Cities and Climate-KIC created a comprehensive document, mapping cities across the world with circular approaches in five thematic areas: City-wide circular strategy, Urban refurbishment, Procurement, Utilities and Civic waste. The aim of this document is to show good practices and policies across the world and encourage their replication. The Municipality-led circular economy case studies document shows how circular economy strategies are adopted and implemented within urban environments and by municipalities. It emphasizes how different regions use different approaches based on specific needs and resources.

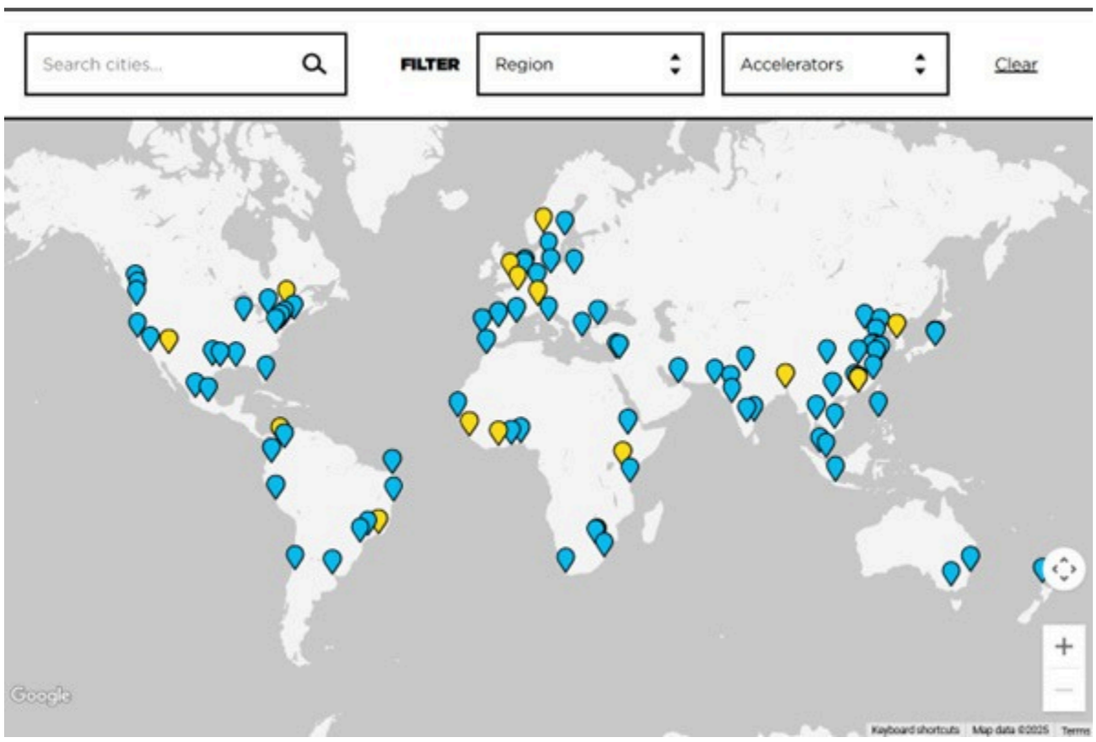
Circular economy in cities and regions

C40 cities is a worldwide organization, which has 97 member cities. The goal of the organization is to encourage the cities to become more sustainable, resilient and eco friendly. The main actions, through which this happens are:

- 1.5°C Climate Action Plans - C40's Climate Action Planning programme supports cities around the world to create and implement climate action plans in line with the 1.5°C target of the Paris Agreement.
- High-Impact Accelerators - High-Impact Accelerators are a framework designed by C40 to help cities implement science-based solutions that address climate challenges while creating more equitable and resilient communities.
- Inclusive & Thriving Cities - In the midst of climate breakdown, mayors are facing multiple interlinked crises, including the COVID-19 pandemic and persisting social injustices. A Global Green New Deal with inclusive climate action at its heart is needed to build thriving communities that work for everyone.

You can find if your city is part of the C40 Cities organization here:

Fig. 1: C40 Cities Worldwide



Source: C40, 2025.

The organisation also has a Knowledge Hub that focuses on creating and gathering practical resources and studies in the fields of waste regulation, different kinds of pollution and many more topics, connected with the methods of sustainability and circular economy

Repairing broken household items, repurposing household items and library of tools

Just by doing a small thing everyday, a little choice you make regularly, may not seem like you contribute to the circular economy of the world, but actually it makes a difference. Mindset change is one of the most important steps for making the transition from linear to circular economy. You can start by following these 5 easy ways to shift some practices in your home to make in more sustainable and join the circular community:

- Recycle shower water
- Repair broken household items
- Circular gardening
- Repurpose household items
- Seek out local support and initiatives

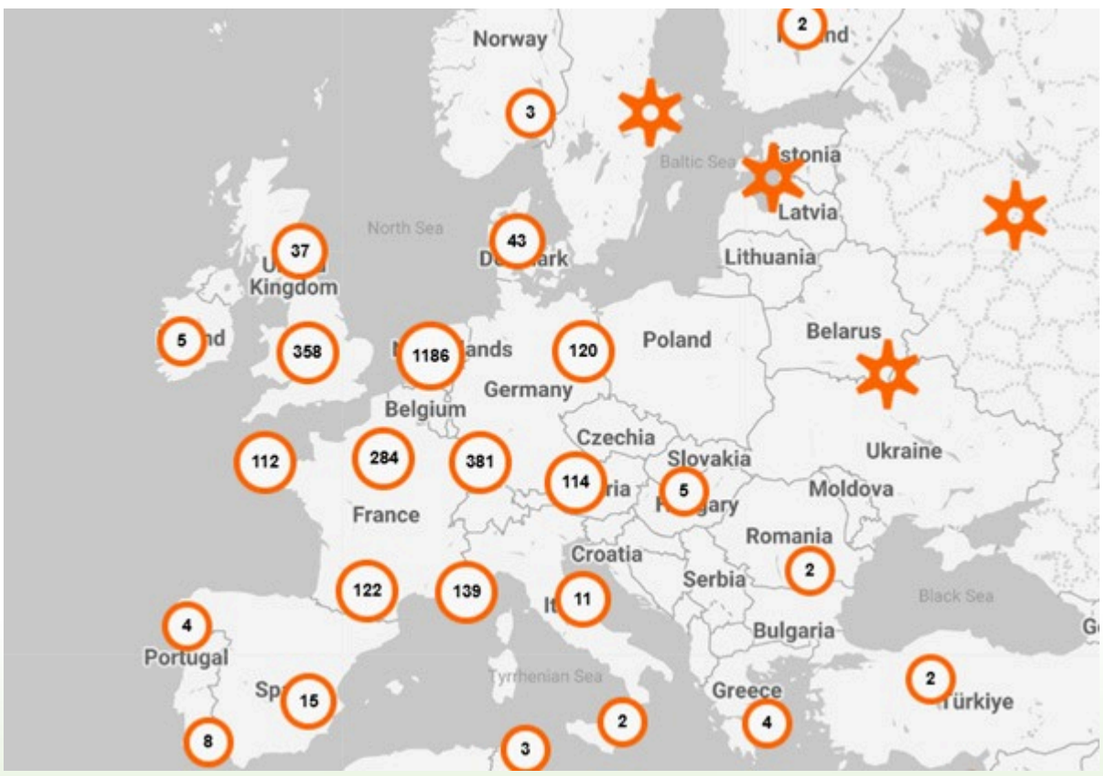
All of these steps don't need to be followed by a specific order and of course you don't need to do all of them to contribute to the circular economy. In the article you'll find more information about each of them and resources you can utilize. So don't hesitate to choose one of them and start your circular journey. In this part of the chapter we will dive in a little more in the concept of repairing the items you already own. Of course this requires having the necessary tools for the repairs, which not all people can afford or have space to store. Furthermore, buying the tools in order to use them once or twice follows a consumption behavior attributed to the linear economy principles, which we try to avoid when shifting to a circular economy mentality. In such cases tool libraries, repair cafes and maker spaces are coming to the rescue. These are spaces where you can rent or lend the tools you need and even ask for guidance or help in the process of repair.

For example the Buffalo's Tool Library has around 5,000 items you can lend and also has volunteers that can help you with the repair. In this video you can hear the story behind the Buffalo's Tool Library and more about the way it functions.

Best Practices and Real Case Scenarios

Another way of beating consumerism habits is repair cafes. Repair cafes focus more on the community aspect. Again they provide the tools and volunteers with expertise, but the whole repair happens in the cafe. This builds a community of people, caring for the environment and trying to consume less and repair more. You can check in this map which is the nearest Repair cafe and in the Repair cafe website you can find guidance on starting your own.

Fig. 2 Repair Cafe Map



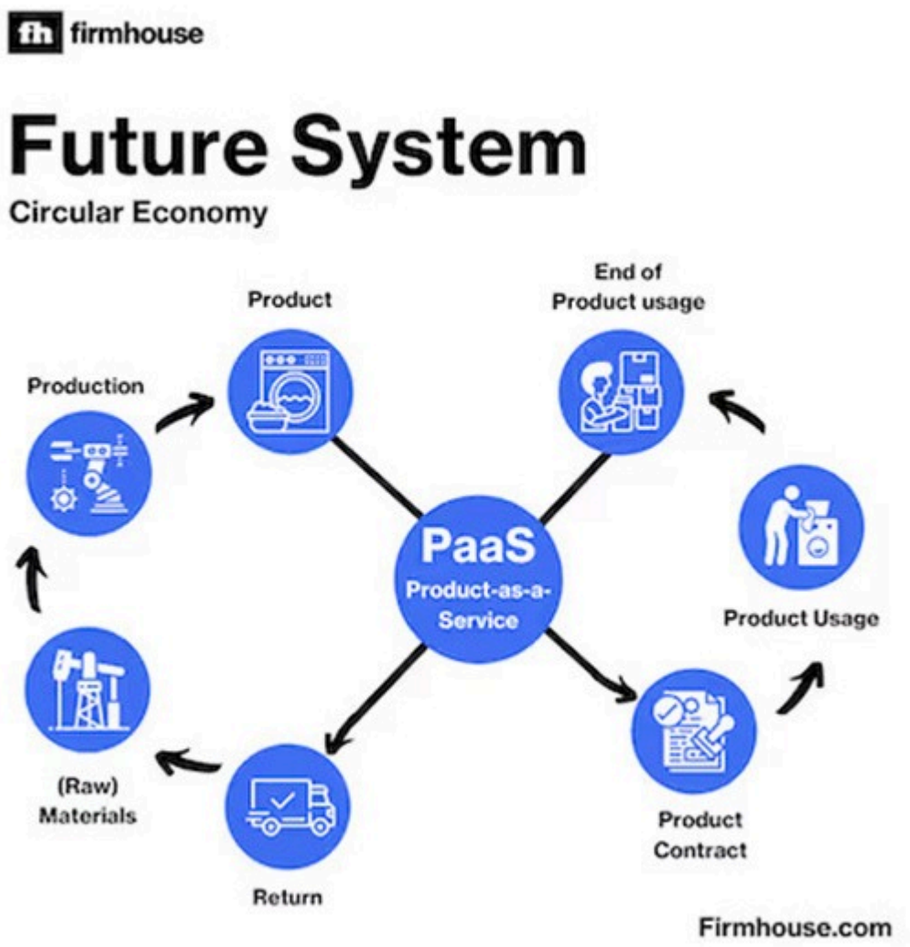
Source: Repair Cafe, 2025.

The third type of initiatives that can help one with the repair aspect of the circular economy is the maker spaces. This is a space where again you can repair your stuff and ask for help and guidance, but also it focuses on the work with different technologies like 3D printers. You can search for a makerspace near you here. In both the Repair cafe and the Makerspace (of course it depends on the specific approaches of the people working in it) you can find different learning activities like workshops, lectures and many more.

Product as a Service Model

Another way to enhance the use of the circular economy perspective more often is by reforming business approaches. As you already know, the linear economy focuses on producing products and selling more of them, usually no matter the cost to the environment. On the other hand the circular economy shift encourages a new way of thinking and doing business. It is called the Product-as-a-Service (PaaS) model. It encourages more companies to use the concept of producing better products, giving them for rent and then offering ways to repair and repurpose products.

Fig. 3 Future System Circular Economy



Source: Firmhouse, 2025.

Let's explore some ways the Product-as-a-Service model is incorporated into different fields and companies

1. ColdHubs: solar-powered and cooling as a services solutions - In the developing countries there is a big problem with post-harvest losses in fruits, vegetables and other perishable food, because it goes bad because of the heat and the inability of the local farmers to provide cool storage spaces. The solution which the locals invented is the solar powered walk-in cold rooms, called ColdHubs, where the farmers can store their perishable food. With this invention they eliminate the need for many refrigerators, they contribute to decreasing food waste and lowering costs for local farmers.

2. Printing as a Service - With the goal to become more environmentally friendly, to bring more awareness into how our actions influence the planet and of course to create a stronger bond between the company and the customer, Canon tries to transition to the PaaS model. Instead of manufacturing printers, toners, and different printer equipment it gives customers the opportunity to print their documents at the cost of a one time of monthly fee. Here you can learn more about the Canon and ColdHubs initiatives and 3 more applications of circular approaches and of transitioning to the Product-as-a-Service model. The article explores LaaS - Lighting-as-a-service, EaaS - Equipment-as-a-service and TaaS - Trucks-as-a-service.

3. Lockers for renting sport equipment for free - The Swiss start up Equip focuses on installing lockers where you can access sports equipment through the app of Equip and play without the need to buy the equipment yourself. They already have more than 400 locations with equipment lockers across Europe. The initiative is sponsored by Decathlon and they also have different types of equipment for different sports like football, volleyball and even canu.

4. Library for borrowing books free of charge, returning or exchanging with others - The Little Free Library is an organization, aiming to inspire more people to read, even if they don't have the resources to buy a book (or want to read in a more sustainable way), and to share their favourite books with everyone. They already have over 200,000 Little Free Libraries in 128 countries. But the initiative doesn't stop there. On their website you can find guidance on how to start a Little Free Library in your town. There you'll find directions on how to actually build the library and inspiration from the already built ones. And if you want to just look at some pretty little libraries, you can find them on their Instagram. In the capital of Bulgaria, Sofia there is also a local initiative, which is one not so little but also not very big library. It is called Chitalnyata, which means the reading place. There you can get a subscription card by bringing one or more books and leaving them in the library. The card gives you access to the books and you can take them home or read them on the sofas of the library.

Fig. 4 Free Sport Equipment Map in Europe

Source: EquipSport, 2025.

5. Charity Re-Use Center - The Reuse Network in the United Kingdom serves as a charity organization and with its practice of giving a second life to various household items it actually incorporates a circular economy model. Instead of throwing away their unwanted furniture and other home goods, people can give them to the organization which in turn gives them to low income families. Through this method waste is decreased, adding value for the society.

Fig. 5 Little Free Library Example

Source: Little Free Library, 2025.

Summary and Key Implications

In summary there are many ways the circular economy models can be implemented in different sectors, companies, and processes. They can be applied even on the smallest scale of our own homes.The list of community approaches presented in this chapter is not exhaustive, as you can find many more, if you have curiosity and enthusiasm. Because every one of us can be part of the change we want to see. Even if you don't have the creativity to build a Little Free Library, or your company doesn't have the resources yet to transition to a Product-as-a-Service model, you can still explore the opportunities that are already in front of you. Don't hesitate to join a repair class in the local Repair Cafe or just use the local library instead of buying a new book. There are many ways you can contribute to a more circular economy. Don't wait! Go and see what happens!

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Youth Workers Corner n°10

Video
TFN Presents Community Activities

Hands-on Tips for Youth Workers

To ensure storytelling is engaging, inclusive, and impactful.

1.Circular Practice Reflection Diary
Give participants a simple journaling prompt each day:

- What did I repair, reuse, borrow, or share today?
- What waste did I avoid?
- How did this choice feel?

Make it interactive: Encourage drawing, notes, photos, or voice recordings — whatever fits different expression styles. Over time, the diary becomes a personal transformation story.

2. Try a Mini Repair Challenge Make repairing fun and low-pressure. Set up: Ask participants to bring one small broken object (headphones, bag zipper, toy, phone case, etc.).
Set up simple "stations":

- Glue + tape + sewing kit station
- Screwdriver + pliers station
- "Ask a helper" station (you can invite a handy person)

Goal: Even small wins count — fixing a loose button is already circular action. Make it interactive: Have a reflection circle after the workshop. Ask the participants How did it feel to fix instead of replace?

3. Try a "Swap, Don't Shop" Event Super fun, low-cost, and social.
Set up:

- Ask everyone to bring 3–5 items in good condition.
- Sort by type (clothes, books, electronics, kitchen items).
- Let people choose something new-to-them before donating leftovers to charity.
- Make it feel special and engaging: Play music, add a "try-on corner," make it festive.

4. Map the Circular Ecosystem in Your City Turn the abstract into a visual network.
Set up: Use a big sheet of paper or a digital map (like Google My Maps).
Add pins for:

- Libraries
- Repair cafés
- Tool libraries
- Thrift stores
- Makerspaces

Draw arrows to show how materials, skills, and people flow.
Make it interactive: Questions to ask:

- Where is repair easy?
- Where is repair difficult?
- What's missing?

Create a mini "Circular Guide to Our City" poster.

Tips:
• Focus on Skills, Not Just Concepts
• Encourage Small, Consistent Changes
• Highlight the Community Element

STORY MAP

Community Activities

Characters

Amira - a young teacher who believes every small change can make a big difference.

Jonas - a carpenter who hates seeing things go to waste.

Nia - a student who loves art and inventing things from scrap.

Setting

The peaceful town of Riverbend, where the weekly market is the heart of the community.
Over time, stalls have filled with cheap, disposable goods, and the town's landfill is nearly full.

Beginning

Amira organizes a class cleanup near the river and is shocked at how much waste they collect. At the next town meeting, she says: 'We can't keep throwing things away. What if we built a circle, not a landfill?'
The townspeople are curious but unsure what she means.

Middle

Amira teams up with Jonas and Nia to create the 'Circle Market', a weekend event where community members bring old or unused items to repair, swap, or repurpose. When neighbors start trading and saving money, word spreads fast. The market becomes a popular event!

End

Months later, the landfill's waste volume has dropped dramatically. The town adopts a plan:

- Every neighborhood has a repair hub.
- Local businesses swap to reusable items and packaging.
- People start trading unused and unwanted items at the market.

Problem

Riverbend was producing too much waste due to a wasteful lifestyle, polluting the town and overflowing the landfill.

Solution

Through community-based circular economy activities, the town transformed waste into resources and built a sustainable and more connected community.

Digital &Tech Innovations

Introduction

Look around you. Smartphones, laptops, tablets, smartwatches, headphones, gaming consoles... Digital and electronic devices are everywhere, deeply integrated into our daily lives, work, and entertainment. They connect us, inform us, and offer incredible convenience. But this digital revolution comes with a hidden cost: a rapidly growing mountain of electronic waste, or e-waste.

Our current relationship with electronics often follows the linear "take-make-dispose" path. We extract valuable and often scarce materials, manufacture complex devices, use them for a relatively short time (sometimes only until the next model comes out!), and then discard them. This generates vast amounts of waste, pollutes the environment with hazardous substances, and squanders precious resources. E-waste is, in fact, one of the fastest-growing waste streams globally.

But what if technology itself could be part of the solution? The circular economy offers a framework to rethink how we design, produce, use, and manage electronics. Digital innovations, from smart design and manufacturing to online platforms and data analytics, can be powerful enablers of circularity. They can help us extend product lifespans, facilitate repair and reuse, improve recycling, and create entirely new circular business models.

This chapter explores the critical intersection of digital technology and the circular economy. We'll delve into the challenge of e-waste, examine how electronics can be designed for a circular future, discover how digital platforms support sharing and reuse, and look at cutting-edge technologies that are accelerating the transition. We'll also highlight real-world examples and discuss how young people and youth workers can leverage technology for a more sustainable and circular world.

Technology is a double-edged sword: it creates environmental challenges like e-waste, but it also offers powerful tools to build a circular economy.

The E-Waste Challenge: Our Digital Footprint

What is E-waste? Anything with a plug, battery, or power cord that has been discarded. This includes everything from large appliances (fridges, washing machines) to small gadgets (phones, chargers, toys) and IT equipment.

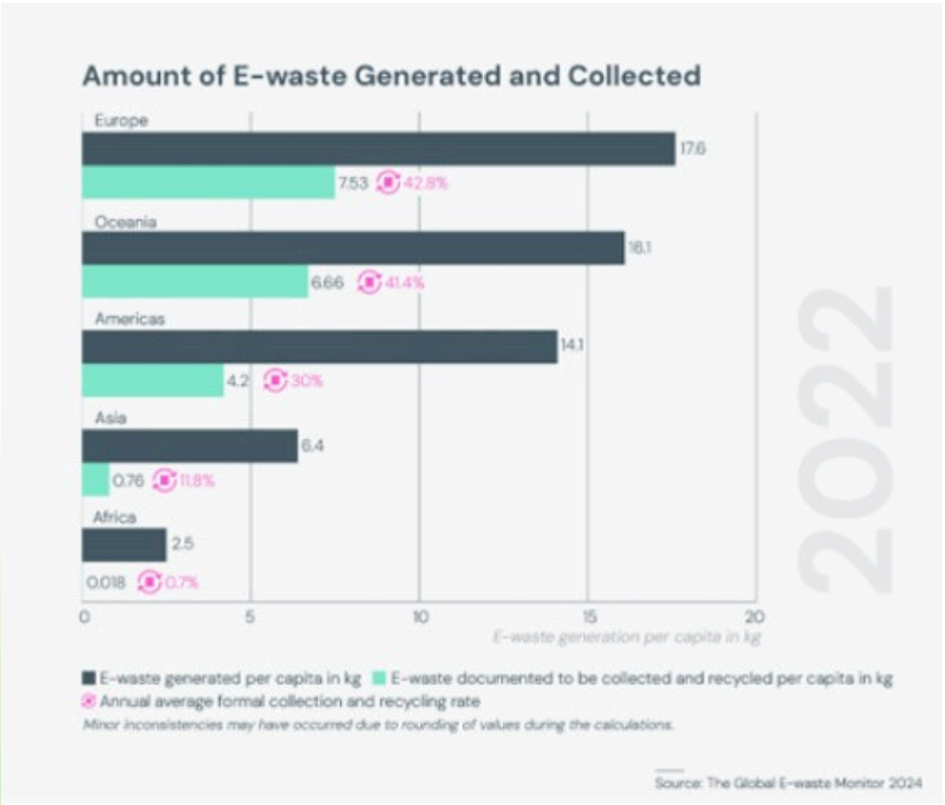
Why is it a Problem?
• Volume: It's the fastest-growing domestic waste stream globally. The EU generates over 10 million tonnes of e-waste annually – equivalent to throwing away dozens of smartphones per person each year! (Eurostat).

• Toxicity: E-waste contains hazardous substances like lead, mercury, cadmium, and flame retardants, which can leach into soil and water if not managed properly, harming ecosystems and human health.

• Resource Depletion: Electronics contain valuable materials like gold, silver, copper, palladium, and rare earth elements. Discarding them means losing these resources forever and needing to mine more, often under poor environmental and social conditions. Less than 40% of e-waste in the EU is estimated to be formally collected and recycled (European Parliament).

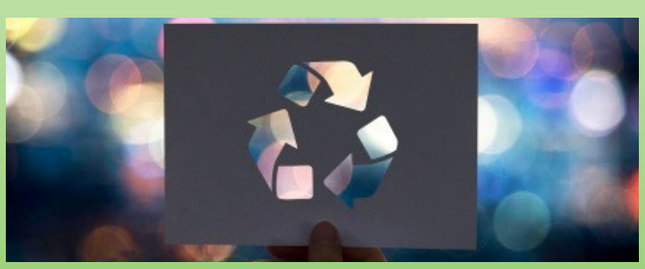
• Planned Obsolescence: Some products seem designed to fail or become outdated quickly, encouraging consumers to buy new ones. This can be through software updates that slow down older devices, lack of repair options, or rapidly changing designs/features.

Fig. 1: C40 Cities Worldwide



Source: Unitar, 2024.

Designing Electronics for Circularity



The circular economy starts at the design stage. How can we make electronics fit for a longer, more circular life?
• Durability: Creating products built to last, using robust materials and construction.

• Repairability: Designing products so they can be easily disassembled and repaired. This includes making spare parts available and affordable, providing repair manuals, and avoiding glued-in components or proprietary screws. The “Right to Repair” movement advocates for legislation to enforce this.

• Modularity & Upgradability: Designing products in modules allows faulty or outdated parts (like batteries or cameras) to be replaced or upgraded without discarding the entire device (e.g., Fairphone).

• Recyclability: Using materials that are easily recyclable and designing for easy disassembly at the end-of-life stage to facilitate material recovery. Avoiding hazardous substances simplifies recycling.

• Using Recycled & Renewable Materials: Incorporating recycled plastics, metals, and even bio-based materials into new products reduces reliance on virgin resources.

Digital Platforms & Business Models for Circularity

Digital technology enables new ways of accessing and using products beyond traditional ownership:

- Sharing Economy Platforms - Websites and apps connect people to share or rent assets like tools, cars, accommodation, or even clothing, increasing the utilization of existing products (e.g., Vinted for clothes, local tool libraries).

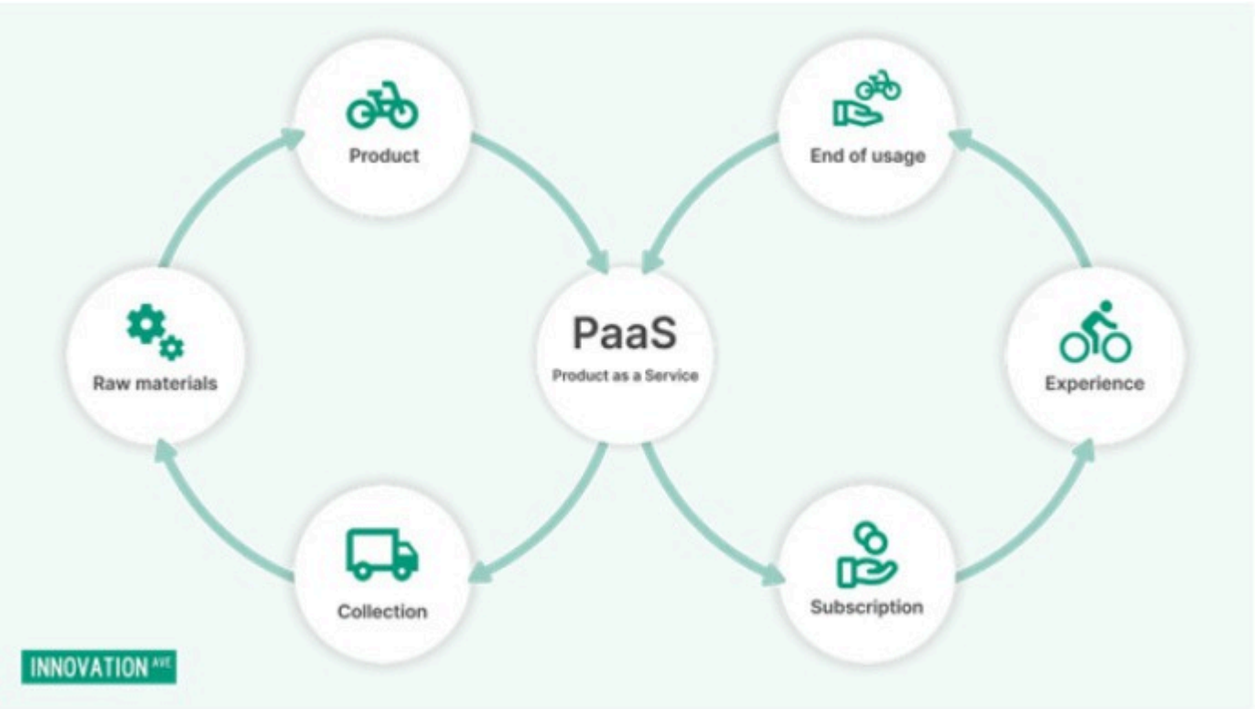
- Product-as-a-Service (PaaS) - Instead of buying a product (like a washing machine or lighting), customers pay for its service or outcome (clean clothes, illumination). The manufacturer retains ownership and responsibility for maintenance, repair, and end-of-life management, incentivizing them to design for longevity (e.g., Signify/Philips lighting services).

- Online Resale & Refurbishment Marketplaces - Platforms make it easy to buy and sell used or refurbished electronics, extending their lifespan (e.g., Back Market, Refurbed).

- Digital Product Passports - Imagine a digital record traveling with a product, containing information about its materials, components, repair history, and recycling instructions. This enhances transparency and facilitates reuse, repair, and recycling throughout the value chain. The EU is actively working on implementing these.

Several cutting-edge technologies are enabling the shift towards a circular economy for electronics. The Internet of Things (IoT) utilizes sensors embedded in products to monitor their condition, predict maintenance needs, track usage, and facilitate recovery, thereby improving asset management and enabling Product-as-a-Service (PaaS) models.

Fig. 2 Product as a Service



Source: Innovationavenue, 2023.

Artificial Intelligence (AI) and big data play a crucial role in optimizing resource use during manufacturing, enhancing sorting processes in recycling facilities, predicting product failures, and personalizing recommendations for sustainable consumption. Blockchain technology offers secure and transparent tracking of materials and products throughout the supply chain, verifying authenticity, provenance, and compliance with sustainability standards, which is particularly useful for Digital Product Passports.

Finally, 3D printing, or additive manufacturing, enables on-demand production of spare parts, reducing waste from overstocking and facilitating localized repair, with the potential to utilize recycled materials as feedstock.

The European Union is actively promoting circularity in electronics through various policy drivers. The Circular Economy Action Plan includes specific initiatives focused on ecodesign, the right to repair, tackling e-waste, and promoting circular business models in the electronics sector. The Ecodesign Directive and Energy Labelling Regulation are setting increasingly stringent mandatory requirements for energy efficiency, durability, repairability, and recyclability of electronic products, with new rules specifically targeting smartphones, tablets, and other devices.

The Waste Electrical and Electronic Equipment (WEEE) Directive establishes targets for the collection and recycling of e-waste, making producers responsible for the end-of-life management of their products through Extended Producer Responsibility (EPR). Additionally, the Batteries Regulation sets sustainability requirements for batteries, including targets for recycled content and easier replaceability.

Best practices and real-world case scenarios illustrate the potential of circular electronics. Fairphone, a social enterprise in the Netherlands, designs modular smartphones with a focus on longevity, fair materials, and repairability, allowing users to easily replace components. Refurbed and Back Market are online marketplaces specializing in professionally refurbished electronics, providing warranties and making high-quality second-hand devices accessible and trustworthy.

Fig. 3 Fairphone

Source: Sector, 2023.

Closing the Loop in the Netherlands offers a “waste-neutral” approach for mobile phones by collecting and recycling an equivalent number of scrap phones in developing countries for every new phone sold by participating partners. Repair Cafés, which are global and local community initiatives, involve volunteers helping people repair broken items, including electronics, thereby promoting repair skills and reducing waste; The Restart Project network is an example of such an initiative. Urban mining initiatives focus on extracting valuable materials from e-waste collected in cities, treating it as a valuable resource pool, with projects funded by organizations like EIT RawMaterials. Lastly, major tech companies such as Apple, Dell, and HP are increasingly incorporating recycled plastics, aluminum, cobalt, and rare earth elements into their new products.

Major brands like Apple, Dell, and HP are increasingly incorporating recycled plastics, aluminum, cobalt, and rare earth elements into their new products.

Summary and Key Implications

Digital technology and electronics present both significant challenges and immense opportunities for the circular economy. While e-waste is a major concern, innovation in design, digital platforms, and enabling technologies offers pathways to a more sustainable future.

Key Benefits of Circular Electronics & Tech:

- Environmental: Reduced e-waste, conservation of valuable and scarce resources, lower carbon footprint from manufacturing and resource extraction, reduced pollution.
- Economic: Creation of new business models (PaaS, refurbishment), job creation in repair, refurbishment, and recycling sectors, reduced material costs for manufacturers, potential for lower consumer costs through longer product use or service models.
- Social: Increased access to technology through affordable refurbished options, empowerment through repair skills, reduced exposure to hazardous substances.

Technology is not inherently linear or circular; it's how we design, use, and manage it that matters. By embracing circular principles, leveraging digital innovation, and making conscious choices, we can harness the power of technology to build a closed-loop system that benefits both people and the planet, turning the tide on e-waste and unlocking sustainable value.

Recommendations for Youth & Youth Workers

1. Consume Consciously - Question the need for new devices. Consider durability, repairability, and brand ethics before buying. Explore refurbished options.

2. Extend Lifespans - Take care of your devices. Learn basic troubleshooting and repair skills (check iFixit, YouTube tutorials, local Repair Cafés).

3. Dispose Responsibly - Never throw e-waste in the regular bin! Use designated collection points for proper recycling.

4. Embrace Sharing & Service Models - Utilize sharing platforms or consider product-as-a-service options where available.

5. Advocate & Educate - Raise awareness about e-waste and the Right to Repair. Support brands and policies promoting circularity. Use digital tools to spread the message.

6. Develop Digital Skills for Sustainability - Explore how coding, data analysis, or digital design can contribute to circular solutions.

Challenges

1. Design Complexity: Modern electronics are intricate, making disassembly and repair difficult.

2. Consumer Habits: The desire for the newest technology often overrides sustainability concerns.

3. Global Supply Chains: Tracking materials and ensuring ethical practices across complex international supply chains is challenging.

4. Recycling Infrastructure: Efficiently collecting and recycling the vast amounts and complex mix of materials in e-waste requires advanced infrastructure and technology.

5. Data Privacy & Security: Increased connectivity (IoT, PaaS) raises concerns about data management and security.

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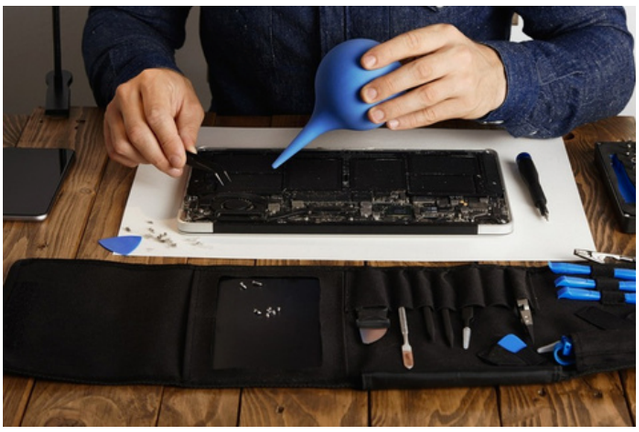
Workshop n°1 Theme: Tech Detox Lab: Giving Devices a Second Life

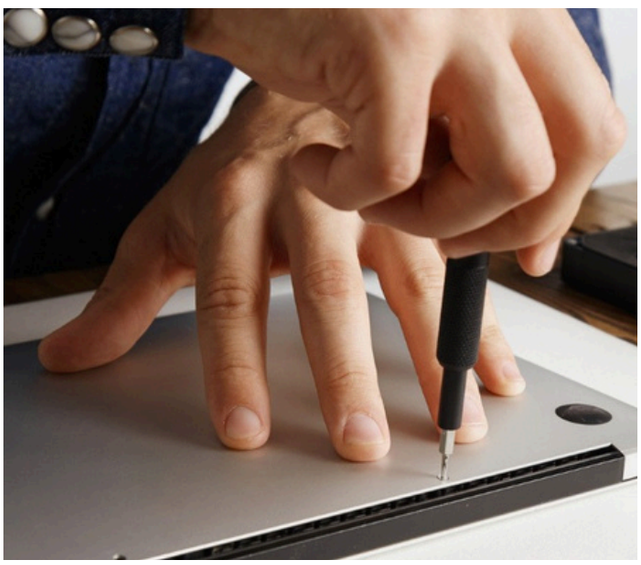
Understanding digital waste and re-imagining technology through circular design and collective repair culture



Purpose and Objective of the Workshop

This session engages youth in re-evaluating their relationship with technology. Through hands-on exploration and creative problem-solving, they learn how e-waste forms, what "Right to Repair" means, and how circular principles—reuse, repair, refurbishment—can extend a product's life. The workshop cultivates digital responsibility, creativity, and teamwork.

Target Group and Group Size
Target Group: Young people aged 15–25
Optimal Group Size: 10–15 participants



Proposed Workshop Procedure and Methods Used
Step 1: Icebreaker – "My Digital Day" (8 minutes)
Participants form pairs and list all devices they use from morning to night. Share one that feels "essential." Ask: "What happens when it breaks?" Collect quick answers on a board—usually "buy new."

Step 2: The Hidden Cost Game (12 minutes)
Show photos of a smartphone, laptop, and earbuds. Groups guess:

- How many materials are inside?
- How much e-waste is generated yearly in the EU?
- Reveal key facts and discuss resource depletion and toxic waste.

Step 3: Device Autopsy (15 minutes)
Provide a few broken electronics (safe items like old keyboards, mice, phones with batteries removed). In small groups, participants carefully open or inspect them. Identify materials and parts that could be repaired or reused. Use magnifiers or photos if disassembly isn't possible.

Step 4: Circular Redesign Sprint (15 minutes)
Challenge each group to re-imagine their device for a circular future: modular, repairable, recyclable. They sketch and label new versions, adding features like replaceable batteries or recycled casings. Encourage wild, creative thinking.

Step 5: Collective Action Wall (10 minutes)
Groups share redesigns. Then brainstorm real actions: visiting a Repair Café, starting a local e-waste collection box, running a "Swap Your Tech" day. Record these on a large poster titled "Our Digital Loop Commitments."

Required Materials and Estimated Duration

Old electronics or device photos, small tools (screwdrivers), sketch paper, markers, safety gloves, fact cards on e-waste statistics.
Duration: 60 minutes Setup time: 15 minutes

Final Discussion and Feedback
Reflection circle questions:

- “What surprised you about what’s inside your devices?”
- “How could repair become ‘cool’ again?”
- “How can technology be both digital and sustainable?”

Youth Worker Debrief Notes
Link the exercise to global justice—where e-waste is exported, who works in recycling, and why “right to repair” policies matter. Encourage participants to design a small community challenge (e.g., repair workshop or e-waste art exhibit) that continues the learning cycle.

Youth Workers Corner n°11

Video
The Digital Loop

The Digital Loop: Closing the Circuit of Technology

E-waste mountains in Europe

Europe produces 10+ million tonnes of e-waste annually

Devices designed to fail

Fast upgrades and planned obsolescence lead to waste

Handshake over cloud

Circular business models like PaaS and sharing platforms emerge

EU flag with law book

Europe's Circular Economy Action Plan and Right to Repair Laws drive progress

Recycling symbol with phone

Choose durable and repairable products, recycle properly

Only ~40% of e-waste is formally recycled

Recycling trucks in action

Designing tech that lasts with durable, repairable, and recyclable features

Circular gear with principles

Smart tech innovations like IoT and AI improve circular systems

AI brain with sensors

Repair Cafés and Fairphone promote repair culture

People repairing electronics

The Future
Circular Economy

Introduction

Previous chapters have illustrated variety of domains where circular economy model is a viable way to go. It is modern, smart and innovative way to help the world where creating tons of waste is a thing of the past. Compared to the consuming way of take, make, dispose we can move forward to design tools, products and complete systems which can create a loop – reused, repaired or recycled in such ways that help sustain the environment, resources and reduce harm.

Obviously, we are not talking about curing the problems of today...It is all about reimagining the way and style we live, travel, work and enjoy life for a better tomorrow.

This final chapter steps into the potential future: a circular economy model that involves new ideas, recycling technologies and mostly, the fresh ways of thinking how we can transform the industries, pollution, waste management and our everyday life-style. This is related to all areas of our lives – from fasion to technology, from agricultural cultivation to construction models – we can always overtake the obstacles and apply smarter, more sustainable solutions. For this reason, we point on some best practice but also focus on pertaining obstacles to be overtaken – shifting habits, rethinking economic models and incentives, aiming to build systems which are inevitable to make circular practices widespread and accessible.

Beyond this ground and the way we use stuff and live our lives currently, there is an exciting potential to redefine these ways. Simply, circularity is not solely about sustainability – it is a chance to create a world with people and the planet co-existing and helping each other. We may foster innovation, strengthen local communities in order to build a future where our own hedonism and prosperity does not come at the expense of our environment.

To make this happen, we need to be united. And there are young people, who are inspirational, creative and passionate to new ideas – they practically stand and constitute the heart of this „revolution“ as it shall be. Let´s drive the change toward a circular future with young people!

Circular Economy as a System of the Future

The circular economy is like a superhero plan for our sustainable future. On the other hand, it is not only about tossing our plastic bottles in the recycling bin; it’s about totally changing how we design and use everything. Let´s be honest, if all our products were built to last, super easy to fix, and could be remade into something new instead of getting thrown away, we’d have a system where nothing goes to waste and resources are always being used. And there are always some positive examples:

- In Slovakia, companies like JRK Slovakia are helping cities cut down on trash with cool tech and education
- In Europe, cities like Amsterdam are building new stuff using old construction waste

This way of thinking is catching on because it's smarter, fairer, and way better for our planet. The circular economy isn't just a fleeting trend; it's the blueprint for a better future.

Technological Advances Driving the Circular Economy

Let´s think about technology as a supercharger for making our planet healthier. It's all about creative ideas that benefit the sole purpose of circular economy, where we waste less and reuse more.

Think about technologies we already have:

- Apps like Slovakia's Repairably help you find stuff that's easy to fix, so you don't just throw things away.
- AI (Artificial Intelligence) is like a super-smart detective for materials, making sure things get reused instead of trashed. In Prague, AI even helps trash trucks drive smarter, cutting down on pollution.
- 3D printing lets us make exactly what we need, right when we need it, which means way less waste.
- Companies like Ecovative in Europe are even making packaging out of mushrooms instead of plastic – how cool is that?
- And hopefully, soon we might have self-healing materials which still sounds a bit sci-fi or smart gadgets that tell you when they need a fix.

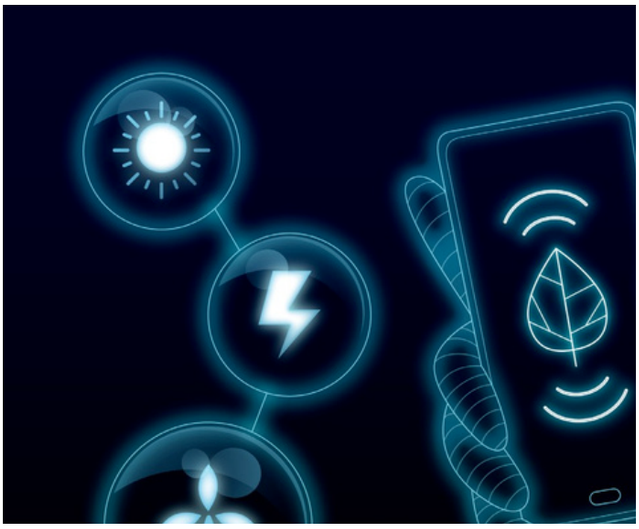
All these amazing technologies are making the circular economy real, helping us build a more sustainable future! Young people are actually driving a lot of these changes because of their passion and new ideas

Localization and Community Building

While the scenario of circular economy is occurring globally, its success is driven dominantly by local communities. This is where magic happens. Let´s take on Slovakia, there are organizations such as INCIEN (Institute of Circular Economy) which cooperate with municipalities and businesses to implement sustainable waste management practices and promote education around circular principles. Such inititatives include repair cafés, sharing libraries or community composting. It is truly about going local – localisations means producing stuff and goods closer to home, in return reducing transport emissions and, the benefit is mainly local – supporting local business and entrepreneurs. Believe it or not, it´s truly about connecting people, helping to build stronger communities and, at the end, creating systems and every day life better for everyone.

Going Circular

Embracing “going circular” sounds like a big idea, but those changes actually start with small, daily behavioral changes. If you didn't throw things away but instead repaired them, would that change how you live? In Slovakia, there is a slowly growing interest in second-hand stores and repair workshops that can mitigate waste and prolong product life. There are businesses in Slovakia embracing circular models too. For example, Slovak company Ekolumi rents eco-friendly cleaning items so that the products are used efficiently and responsibly as a service. On a broader scale, companies across Europe like Philips are leasing their lighting systems, and they recover it as part of



their service. It is not just businesses; government and schools, are increasing their practices too. The EU's Green Deal is also focused on making circular economy practices desirable through policies that force a design regime and development on sustainable design and resource recovery. We all can take action and play our part by choosing to buy second hand, renting, and buying from companies with circular principles and values. Small actions can be part of our collective future where there is no waste and everything is valued.

Building a Circular Future

Let´s imagine a future in which our trash doesn't just accumulate, but actually becomes the feedstock for something else - this is the essence of a circular economy, which is becoming established in Slovakia, Slovenia, Bulgaria, and Greece in some interesting ways.

Take Slovakia for example, where some clever people are doing things with old plastics that go beyond melting them down - breaking down the material in such a way that allows to form new things, reconstituting the chemical structures of the plastics. Or think about how many bottles and cans there are on the streets and how Slovakia seems to be doing a good job at getting them back in the right place, largely thanks to producers' systems that give you a little money back for returning them; a clever mechanism for making recycling work.

Then there's Slovenia, a nation that seems to readily embrace the circular concept. They're pushing companies to think about how products are manufactured from the start, designing them to be long-lasting, fixable, or offered as service, not ownership. Can you imagine, renting your own washing machine - when there was an upgrade - they take the old one away in the correct manner? Also it appears Slovenians are adept at waste sorting so a larger share of it is reincarnated in another way. It is also obvious to see how from certain communities are developing a strong crafting ethos as they come together to fix and reuse things, it is good to see their last place before being destined for a recycling bin was a second life.

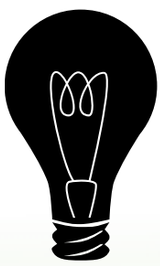
While in Bulgaria you can find the creative types that are taking apart unwanted clothes and creating something completely different and fresh, like funky bags or insulation. This is also a way to deal with our mountains of unwanted textiles, but for textile waste it at least puts in a cool second act. Cities are even starting to invest in better facilities that consider waste as grossly as they can from creating locations where it can be sorted and processed in the best way so it can become a resource again.

And in the sunny Greece that has lots of strong tourist destinations, they are beginning to take food waste very seriously - instead of just throwing waste away, they are composting it. Obviously, the same thing is being done with leftovers and scraps from farming and construction and finding ways to reuse them again that create value from previously classified waste.

While all of these different countries are making some advances on different projects, they all are encountering some of the same obstacles. Sometimes there are not even systems to collect specific types of complex waste, like colored plastic. And even though we are recycling, many times, there are limited markets available for recycling most of these recycled products, which makes it hard to justify the process. Also, in many cases, it is especially hard to convince people to do something other than what they are already doing. When it comes to each person's own ability or habits to change what they have bought and how they disposed of it, people sometimes need a little extra push. Changing habits is the key.

But the positive news is that these countries can seriously kick start a greener future. This will require focused and strategic investment in appropriate infrastructure and encouragement for the smart initiatives that are being established. Governments need to lay out guidelines clearly so that their sectors can practice circularity and also potentially discourage traditional wasteful activities. Development and implementation must involve everyone in the value chain of the economy, including businesses, science, and the general public. A significant part of this effort will be informed learning about the reasons for developing critical appreciation for rethinking consumption behaviors, resource use, and waste disposal practices. By attending to these things, Slovakia, Slovenia, Bulgaria, and Greece can begin to build a future based on significantly more circular resource usage and sustainability.

The transition to a circular economy in Greece, Slovenia, Slovakia, and Bulgaria has varying challenges and opportunities as they are at different implementation stages and have different policy contexts within the European Union as a whole. Most EU economies are functioning still predominantly as linear economies, despite many governments making a commitment to moving towards circular economy principles.



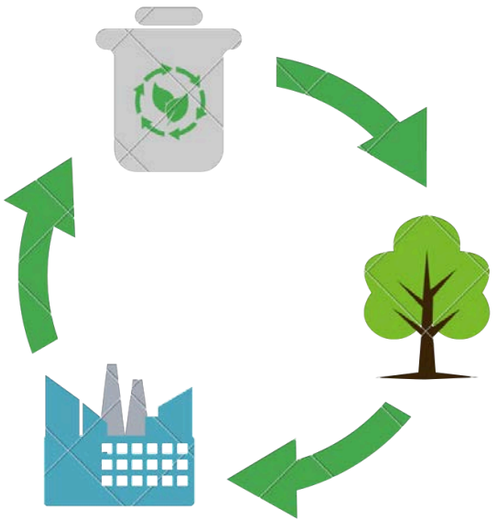
Summary and Key Implications

Slovakia's Hopes and Headaches A pervasive consumerist mentality skewed toward consumption of packaged food and improper disposal; and a tendency towards landfilling municipal solid waste are key challenges. There are also difficulties in tracking circular economy progress, related to the failure to establish commonly accepted and accurate indicators.

The move towards a circular economy remains a central factor in the EU horizontal development and industrial strategy, whereby Slovakia is a member. The objective of the European Union Circular Economy Action Plan is being to trigger this transition and develop monitoring tools. Slovakia has implemented a "Green Economy" platform as part of economic policy goals, and is published solutions, in accordance with the European Green Agreement, and is focused on certain resource intensive sectors like electronics, plastics and construction.

Imagine Slovakia not just making things, but making them in a way where almost nothing goes to waste. They're dreaming of a future where factories are like closed circles, using and reusing materials constantly. Think of the car industry, a big deal there – maybe one day, when your old car is done, its parts don't just get crushed, but are expertly taken apart and used to build new ones, maybe even better. Slovakia sees itself becoming a smart hub for all this clever recycling tech, maybe even teaching other countries how it's done. They're hoping this will make them more self-sufficient and create cool new jobs.

But getting there? That's the tricky bit. Taking these brilliant ideas from a small lab to a giant factory floor is a huge leap that needs a lot of cash and some smart rules. Plus, getting everyone on board – the big companies that have been doing things the same way for ages – to change their ways and invest in these new systems? That's going to take some serious convincing. And they need to make sure they have the right places to actually handle all this "old" stuff so it can become "new" again



Slovenia's Aspirations and Obstacles Slovenia's progress towards an innovation-driven and circular economy is considered too slow, with modernization and transformation processes being shallow.

Increasing environmental regulations and public awareness are positioning circular economy as a valuable factor for improving competitiveness. Technological improvements and innovation are expected to strengthen company competitiveness within the CE framework.

Slovenia's got its image of being a really green, forward-thinking place. They're hoping for a future where we don't even think about buying some things anymore, we just use them. Like, instead of buying a fancy coffee machine that might break in a year, you just subscribe to a service that gives you a great machine and takes care of it if it has problems. They want everything to be designed to last, and when it finally does give up, it's easy to take apart and recycle. Their dream is to barely create any waste at all and to really treasure every bit of resource.

The challenge for them is pushing this idea beyond just a few cool companies. How do you get everyone to embrace this idea of "less stuff, better use"? It means changing how businesses make money and how we, as shoppers, think about what we buy. They also need to make sure that when we do recycle, those materials are actually high-quality and that there are businesses ready and willing to use them to make new things.

Bulgaria's Longing and Leaps Bulgaria is trying to stop landfilling waste by building new waste treatment facilities. But it does not have good ways to manage this. It does not have any targets to measure its progress, and it does not focus enough on the big picture of how to manage resources in a way that is good for the environment. Also, there are not enough financial rewards for businesses to encourage them to be more environmentally friendly. Bulgarian consumers don't have much information, incentives or support from local authorities to encourage recycling and circular actions. Bulgaria is one of the European countries that is not fully prepared for a circular economy, even though there is no national plan for this. The numbers are not as good as the EU average, and there are lots of opportunities to make big changes to how businesses work.

The transition to a circular economy should become a state priority, moving beyond just waste reduction and recycling to decoupling economic growth from waste production. Efforts are directed towards reducing resource and carbon intensity, improving material efficiency, and encouraging reuse. Investments are planned for research and development of circular business models and stimulating industrial symbiosis. There is a recognized need to reorient from a linear to a circular system, focusing on creating products designed for recycling and reuse. SMEs, which form a large part of Bulgarian enterprises, will require closer cooperation to implement new business models.

Bulgaria is embracing an inspiring vision where the concept of vast waste mountains is becoming a relic of the past. The nation is actively charting a course to unlock the hidden value within discarded materials, envisioning a future brimming with innovative businesses and fresh opportunities born from resourcefulness. Picture this: the materials from old, repurposedbuildings becoming the very foundation for new infrastructure like roads and homes. This ambitious shift is driven by a powerful desire for a cleaner, healthier environment for all Bulgarians.

Bulgaria is ready to move forward, even though there are still some very big and exciting steps to be taken. We are investing in the latest recycling infrastructure and systems. But this change is about more than technology; it's about creating a new way of thinking about what we do, encouraging businesses to rethink what waste actually is, and encouraging everyone to get involved in achieving this goal. The rules and punishments will make the change seem acceptable. Bulgaria is well placed for a green future economic environment thanks to its investment in sustainability and clear examples of how it could work for small local businesses, such as a circular economy.
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Greece's Dreams and Difficulties Greece faces limitations in material recovery facilities simply because of inadequate funding and the lack of policy incentives. There's a slow adoption of Product-as-a-Service models, hindered by low consumer awareness, restrictive legislation, and resistance from entrenched businesses. Industrial symbiosis seems to be a bit underdeveloped, lacking industry awareness, cooperation, and sufficient policy support. Regionally, Central Macedonia landfills 90% of its municipal waste. Overall, Greek industries lack an integrated and well-planned approach to circular economy, often limiting efforts to basic recycling. Challenges also include a lack of frameworks for waste declassification and quality criteria for circular products, and businesses failing to communicate environmental benefits to consumers.

Changing to a circular economy model is essential for Greece taking account of its use of resources, knowledgeable workforce, and technical traditions, particularly its primary sector and its small and medium-sized enterprises. The National Strategy for the Circular Economy concerns sustainable management of a resource, circular entrepreneurship and circular consumption. Digitalization is a key driver of circular business models and resource efficiency in the circular economy.

Greece hopes the circular economy can protect its stunning environment, particularly with respect to those breathtaking islands and coastlines that are so critical for tourism. Greece envisions a future in which hotels and restaurants make next to no waste, perhaps converting food scraps into compost for local farms. Greece wants to explore options in its agricultural sector, creatively utilizing remaining pieces from farming. The future entails a more resilient and sustainable economy with a better capacity to respond to climate change.

The challenging aspect for Greece is engaging everyone, including the smaller businesses with resources potentially stretched. They need to establish the systems to ensure things like food waste will be dealt with properly, and they also need to establish markets for these recycled products. It's also about changing mindsets, particularly in a sector like tourism where convenience has so often been privileged over sustainability. They need a system of clear rules and intentions for each of them to begin to work more circularly.

What Ties Us Together and the Road Ahead

What's really interesting is that, even though they are separate countries, they have that in common: we can't just keep taking and discarding. The circular economy is a smart way of thinking about resources, creating new opportunities and looking after the environment. All of these people are dealing with the same problems: better infrastructure, stronger markets for recycled products, consistent rules, new investment and changing how people behave. This includes everyone from big industry to everyday consumers. To move forward, we need the government and pri- vate companies to invest in green projects. We also need exciting new technologies. And we all need to change how we consume things. This will help us to create a future where we say "less waste" and more "resource".

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Youth Workers Corner n°12

Workshop n°1 Theme: Circular City 2050 – Model Game

Purpose and objective of the workshop: the aim is to develop creative and strategic thinking focused on the future of the circular economy in cities

Target group and optimal group size: youth, young leaders, students, environmental clubs; optimal group size: people: 20-30.

Proposed workshop procedure and methods used:

- The introduction to workshop begins with a mini-discussion on the question: What could cities look like in 2050 if they were built on the circular economy principles? (Duration: 10 minutes)
- The model game begins with the division of students into teams – "specialized expert city commissions"; Recommended number of people in a team: 3-5.
- Each team is assigned one specialized area:
  - housing
  - fashion
  - transportation
  - food
  - energy
  - waste collection points
  - community composting sites, community gardens
- The goal of each team – a specialized expert city commission, is to propose solutions related to the principles of the circular economy in its area. (Duration: 20 minutes). The solutions are prepared in the form of a poster as a sector area.
- Team – a specialized expert city commission, will present its proposed vision of a solution with the principles of circular economy (Duration: 15 minutes)
- Group discussion on possibilities of interconnecting solutions between specialized areas (10 minutes)
- Creation of the Circular City 2050 Map: individual posters/posters of sectoral areas will be combined into a large Circular City 2050 map, in which the methods of interconnection between areas will be marked or highlighted (Duration: 15 minutes)
- Additionally, team proposals can be linked to real circular city maps – Examples:
  - circular map of the city of Trnava - Slovakia (Slovak Version): Cirkulárna mapa - Trnava – Moje mapy Google
  - circular map of the city of Bratislava - Slovakia (English Version): Circular Economy – Mesto Bratislava
  - Circular maps - Institute of Circular Economy – Slovak cities (Slovak Version): Cirkulárne mapy - Inštitút cirkulárnej ekonomiky (Duration: 10 minutes)

Required materials and estimated duration:

- Required materials: suitable room, drawings, highlighters, pens, flipchart, board
- Estimated duration: 80 minutes

Final discussion and feedback:
Final discussion with reflection on the possibilities of using the principles of the circular economy in cities. What are the realistic possibilities of transitioning to a circular economy in cities future? How can we as citizens contribute to circular economy in our cities?

Workshop n°2 Theme: Let's give things a new Future

Purpose and objective of the workshop: the aim is to develop students creative thinking focused on ways to give things a "second life" or a "new future". The aim is to connect creative thinking with the principles of the circular economy such as sharing, repairing, reusing or recycling.

Target group and optimal group size: youth, young leaders, students, environmental clubs; optimal group size: 20-30.

Proposed workshop procedure and methods used:

- The workshop begins with a mini-discussion focused on topic of waste in cities. The discussion can be devoted to answering question of how they manage waste at home or how they perceive it in their city, community?
- The workshop begins by dividing students into teams. The ideal number of people in a team: 3-5. Depends on the total number of workshop participants.
- Each team chooses a common thing/product that they commonly use. Teams can choose one, two or several things. Things/products can be of various nature:
  - A piece of clothing, electronics, plastic bottle, book,
- Teams try to design a "new future" with the chosen things/products. How it could be re-incorporated in circular economy with a new life after its original purpose of use. Teams can try to apply several circular economy principles for one thing. (Duration: 20 minutes).
- Teams present their ideas and solutions for a new future and life of things. (Duration: 20 minutes). The presentation can be in form of a poster.
- Voting on the best proposal for a new future for the selected thing (Duration: 10 minutes)

Required materials and estimated duration: 50 minutes

- Required materials: suitable room, drawings, highlighters, pens, flipchart, whiteboard
- Estimated duration: 50 minutes

Final discussion and feedback:
The final discussion takes place on the proposed innovations and solutions for things/products in connection with the principles of the circular economy. The discussion can focus on finding answers to the questions of how it is possible to create conditions in society in general so that as many things as possible gain their next future? How can we contribute overall to giving things a new life according to the principles of the circular economy?

Video
The Future of Cicrular Economy