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Circular Economy explained:

Key topics and needs in CE education for higher secondary schools



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TOPIC LIST



1. Circular Economy explained



2. Preparing for DST



3. Digital Tools 4 Teachers



4. Digital Tools 4 Students



5. Telling Stories about Circular Economy



6. Developing Skills



7. Implementing DST in Schools



8. Initiating Competences for the Future



BY THE END OF THIS SECTION YOU WILL BE ABLE TO...

1. Understand the concepts behind the circular economy model and the critical issues related to the transition from the traditional linear economic model to the circular model.
2. Recognize how the European Union's recommendations on education can facilitate the transition to the new circular economic model.
GIUA COMPOSTING can be considered a best practice for the issue of eco-sustainability
3. Consult selected examples of daylight saving time best practices from research

OVERVIEW

The circular economy is a model of production and consumption that involves sharing, borrowing, reusing, repairing, reconditioning and recycling existing materials and products for as long as possible.

Circular economy is a system aimed at reducing waste and making the most of resources. It contrasts with the traditional linear economy (take, make, dispose). The goal is to extend the lifecycle of products through reuse, recycling, and composting.

The EU has a Circular Economy Action Plan to promote sustainability:

- **Design for long life**
- **Encourage recycling**
- **Reduce waste generation**

This includes policies that encourage businesses, local governments, and citizens to adopt sustainable practices.

In this material you will find out the basics of circular economy and its relevance to secondary school education.

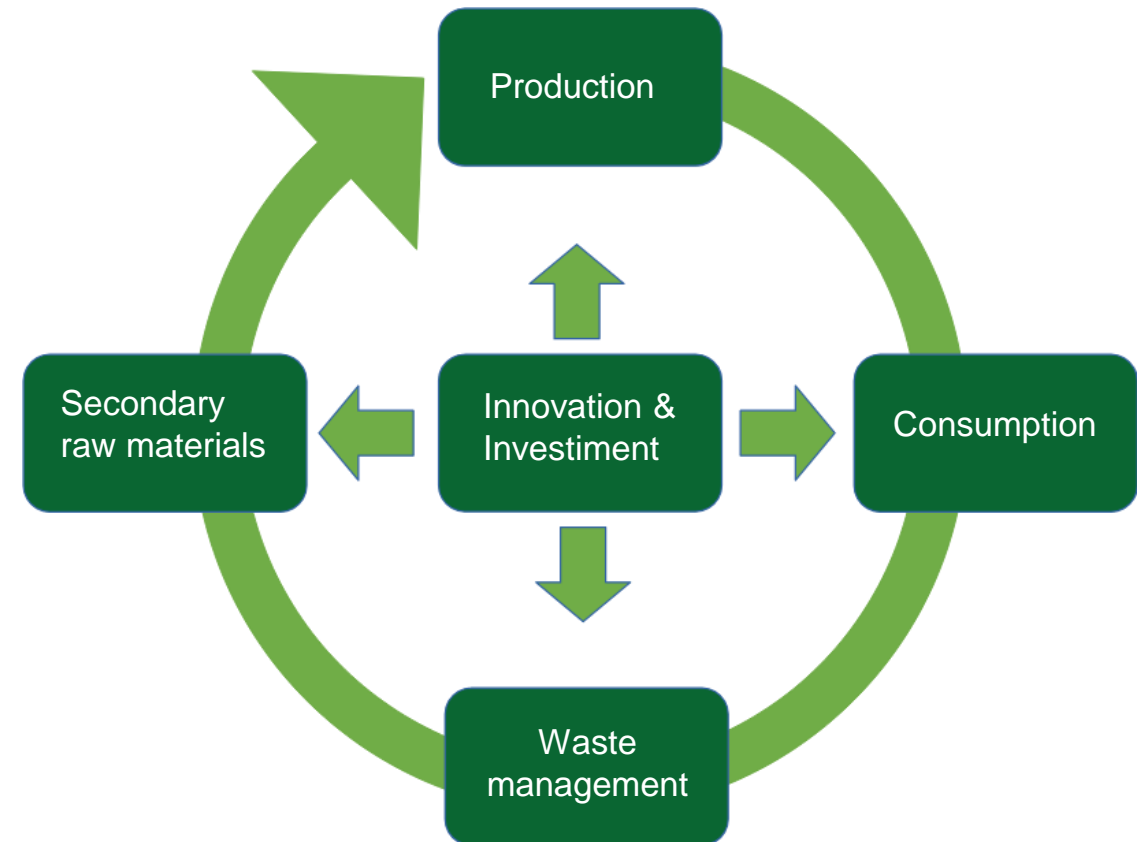
Circular Economy: a new model



The transition from linear to the circular economy will be systemic, deep and transformative, in the EU and beyond. It will require an alignment and cooperation of all stakeholders at all levels - EU, national, regional and local, and international.

The strategic objectives are:

- regenerative growth model that gives back to the planet more than it takes;
- keeping its resource consumption within planetary boundaries;
- reduce its consumption footprint;
- double its circular material use rate in the coming decade.



European Green Deal



The European Green Deal launched a concerted strategy for a climate-neutral, resource-efficient and competitive economy that is focused on:

- Moving to sustainable products
- Making crucial sectors circular
- Waste management and shipment



https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal_en

Moving to sustainable products



A Sustainable product policy framework is based to:

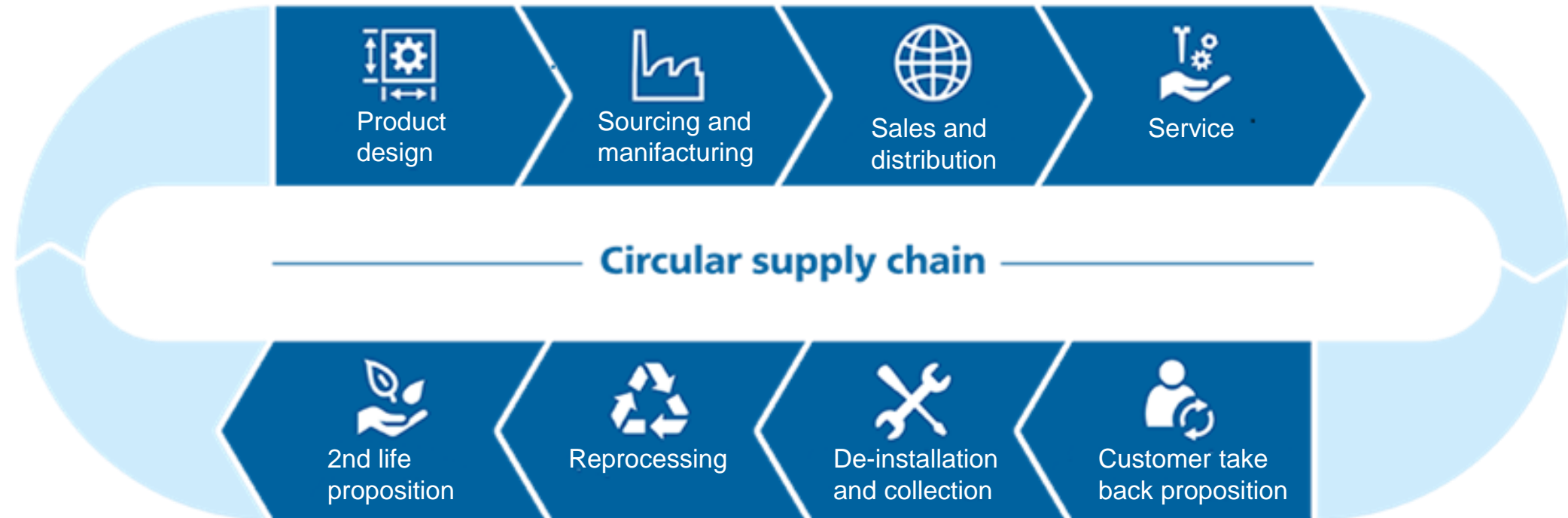
- Designing sustainable products: the products' environmental impacts are determined at the design phase (Ecodesign Directive)
- Empowering consumers and public buyers: consumers receive trustworthy and relevant information on products, including lifespan and availability of repair services, spare parts and repair manuals
- Circularity in production processes:
It can deliver substantial material savings throughout value chains and production processes, generate extra value and unlock economic opportunities.
 - industry-led reporting and certification system
 - sustainable and circular bio-based sector
 - digital technologies for tracking, tracing and mapping of resources
 - registering the EU Environmental Technology Verification scheme

Making crucial sectors circular



The value chains of key products must be reviewed in a circular way

- Electronics and ICT
- Packaging
- Plastics
- Textiles
- Construction and buildings
- Food, water and nutrients



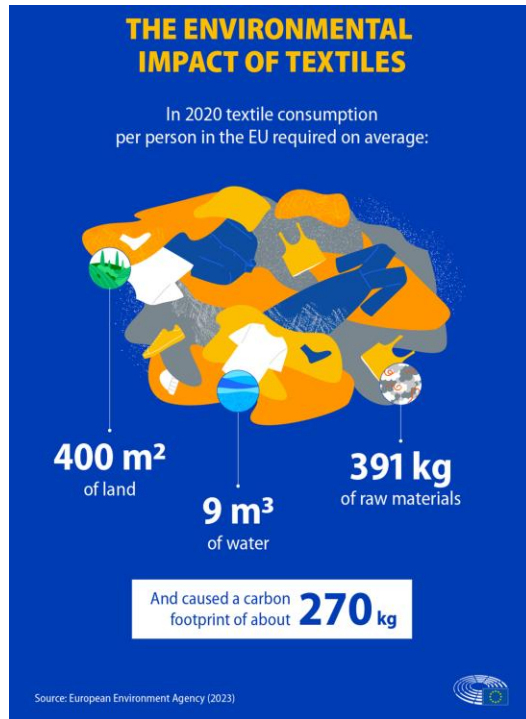
Waste management and shipment



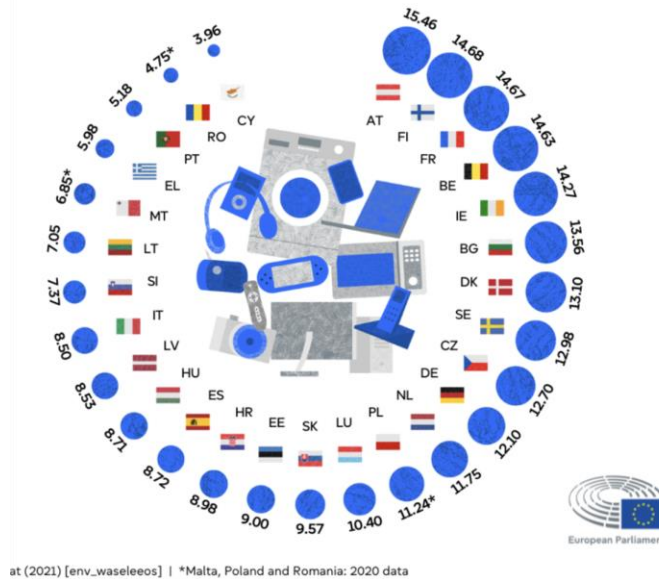
E-waste is one of the fastest growing waste streams in the EU and less than 40% is recycled.

Textile production is estimated to be responsible for about 20% of global clean water pollution from dyeing and finishing products.

All packaging has its environmental cost. On average, each EU resident generated 189 kilos of packaging waste in 2021. Over ten years, the amount has increased by over 20%.



Electric and electronic equipment waste, in kg per inhabitant



Packaging waste generated in the EU by packaging material
84 million tonnes in 2021



Recommendation of CE Areas



Two important areas are Lifelong Learning and Circular Economy.

The EU recommends lifelong learning in several key areas to address future challenges and ensure personal and professional development for all. These areas focus on skills for sustainability, digitalization, and social and professional growth:

- **Personal Development**
- **Professional Skills**
- **Digital Literacy**
- **Critical Thinking and Problem Solving**
- **Communication Skills**
- **Civic Engagement**
- **Health and Well-being**
- **Cultural Awareness**
- **Environmental Sustainability**
- **Lifelong Learning Mindset**

EU's lifelong learning strategy



These recommendations aim to improve education, sustainability, and environmental practices across EU member states.

The EU supports lifelong learning through various programs:

- Erasmus+
- European Education Area
- European Skills Agenda

Type of Education:

- Formal Education
- Informal Education
- Non-formal Education

The role of the school today is not only to provide disciplinary knowledge. The school must also help students acquire fundamental skills for their lifelong development. This approach ensures equity in education. The importance of equity in schools has been emphasized in recent European educational debates.

Inspirational School Project



- Composting is an essential part of the circular economy, turning organic waste into valuable compost.
- It supports environmental sustainability by reducing landfill waste, producing rich soil for agriculture, and promoting resource reuse.

“The change comes from the ability to imagine a different future. While adopting sustainable behaviors is now a necessity for our planet, perhaps it is even more crucial to raise awareness on the topic among new generations.”

<https://www.coopcartiera.it/2021/07/15/economia-circolare-scuola/>



COMPOSTING AT GIUA'S SCHOOL
<https://www.giua.edu.it/>

Thanks teacher Matteo Mulas for the Precious idea and collaboration

Composting at the GIUA School



PHASE 1: Let's organize the work



Let's build our composter



Work in progress...



We are ready to make our compost



PHASE 2: We fill our composters with waste from our snacks



Work in progress...



Let's check if our compost is ready



Our compost is ready

Check What You've Learned About Educational Aspect Of Composting Project



Lifelong learning can be integrated into composting projects through community workshops and educational programs.

A composting project demonstrates how **lifelong learning** and the **circular economy** intersect:

- 01. Promotes continuous education on environmental issues.
- 02. Encourages active participation in the circular economy.
- 03. Provides citizens with practical skills for sustainability.



This is a small reality of the school and now we show another national and international examples...

USEFUL CONCEPTS

- 1. Education & awareness**
Understanding how students perceive recycling and the circular economy can highlight gaps in current educational curricula
- 2. Behavioral insights**
Students' perceptions often reflect broader community attitudes towards recycling and sustainability (LeDrew, 2020) and as students represent the next generation of consumers, workers, and decision-makers

Education & awareness

Definition

It provides insights into how well concepts related to sustainability are being communicated and whether students grasp the importance of these practices. This can lead to more targeted educational initiatives that better address students' knowledge gaps and misconceptions (Adamowicz, 2021; Gaki et al., 2022).

Behaviors insights

Definition

Understanding their attitudes towards recycling and sustainability can forecast future trends in consumer behavior and environmental policy support (Kioupi & Voulvoulis, 2019).

PRACTICAL TIP #1



Issue

Real-world issues that directly relate to life science

What to do...

Integrating circular economy and recycling concepts into science education not only aligns with environmental and sustainability goals but also equips students with knowledge and skills that are relevant to their future as responsible citizens and professionals (Korsunova et al., 2021).

PRACTICAL TIP #2



Issue

Innovative problem-solving within the context of biology, ecology and sustainability

What to do...

The complicated problems of sustainability need transdisciplinary approach using a four-stage teaching model (contextualization, de-contextualization, recontextualization, and trans-contextualization) to promote active citizenry (Chowdhury et al., 2020).



CHECK WHAT YOU'VE LEARNED

01. The students can directly observe and engage with sustainability practices, which is reflected in the high student readiness to involve in activities like “waste management”.
02. There is a significant willingness among students to engage in environmentally friendly practices
03. The role of schools, teachers, and digital resources in spreading awareness about the circular economy and recycling is notably significant.



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Michele Giua Cagliari



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