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# **Does the Digital Wave Drive the Green Transformation: Synergy Between Europe's Circular Economy and Legal Framework**

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# INTRODUCTION

- The circular economy offers a sustainable model, focusing on resource reuse and recirculation.
- Circular economy challenges traditional linear models by aiming for closed-loop systems to maximize resource value.
- Digitalization is essential for this shift, enabling efficient lifecycle management and information sharing.
- Digital technologies provide insights and support transparency, crucial for circular economy practices.
- The interplay between Europe's circular economy and legal frameworks is vital for green transformation.



# THE CURRENT STATE IN EU

- **European Circular Economy Package:**

- Key Directives: Packaging and Packaging Waste Directive, Waste Electrical and Electronic Equipment (WEEE) Directive, End-of-Life Vehicles Directive
- Objective: Resource efficiency, waste reduction, circular business models

- **European Green Deal:**

- Key Initiatives: New Circular Economy Action Plan, Biodiversity Strategy 2030, Zero Pollution Action Plan
- Focus on sustainable product design and circular processes; drive the transition to a sustainable Europe through digitalization and sustainable technologies.



- **Digital Europe Strategy:**
  - Goal: Create a single European data space
  - Application: Support actions with data, drive digital innovation
- **Eco-design Directive:**
  - Purpose: Enhance energy efficiency in product design
  - Promote: Sustainable product development
- **Sustainable Product Policy:**
  - Purpose: Integration of digital technology into product lifecycle management.
  - Impact: Improve traceability and promote recycling and reuse.
- **Waste Framework Directive:**
  - Targets: Waste management improvement, waste generation reduction
  - Encourages: Recycling and recovery of waste



# THE CIRCULAR ECONOMY DEFINES DIGITAL TECHNOLOGY

- The term “digital technology” includes the use of digital tools, systems, and processes to generate, store, process, and transmit information. Such as, Internet of Things (IoT), big data, 3D printing, blockchain, and AR/VR.
- The circular economy defines digital technology as,

A closed-loop system that employs digital technology during the product life cycle stages to implement circular strategies and practices, with the objective of enhancing environmental, social, and economic performance to generate sustainable value.



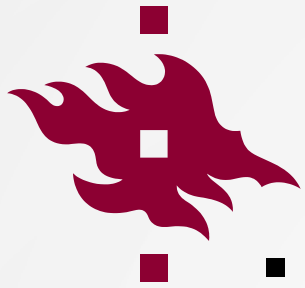
# IMPACT OF DIGITAL TECHNOLOGY ON CIRCULAR ECONOMY PRACTICES

## ▪ Resource Efficiency

- Digital tech enables better tracking and management of resources.
- IoT devices monitor resource usage in real-time, optimizing operations and reducing waste.

## ▪ Waste Reduction

- Integration of blockchain technology enhances supply chain transparency and traceability.
- Secure, unalterable records identify inefficiencies, encouraging waste-minimizing practices.



- **Sustainable Economic Growth**

- AI analyzes data to identify patterns and predict outcomes, guiding sustainable business decisions.
- Optimizes logistics and supply chain management, reducing carbon footprint and increasing efficiency.

- **Closed-Loop System**

- Combination of IoT, blockchain, and AI facilitates closed-loop systems, minimizing waste and enabling continuous resource reuse.
- Essential for achieving circular economy goals, shifting from linear to sustainable resource-focused models.





# CHALLENGES

- **Regulatory Barriers:** Complex and variable regulations in EU member states also make coordination difficult for digital and circular economy integration.
- **Adaptability of Legal Framework:** Accelerating digital innovation requires a flexible and adaptable legal framework that current regulations may not allow.
- **Cross-Sector Coordination:** Coordination between sectors and stakeholders, necessary for a smooth circular economy transition, is difficult.
- **Tech and Infrastructure Barriers:** Integration of digital solutions faces obstacles due to insufficient infrastructure, high costs, and a lack of technical expertise.
- **Compliance Standardization:** Achieving EU-wide compliance and data standards is a significant hurdle.



# DIGITAL PRODUCT PASSPORTS (DPP)

- On December 5, 2023, the European Commission reached a new provisional agreement in Brussels on the Eco-design for Sustainable Products Regulation (ESPR)
  - Set to replace the current Eco-design Directive 2009/125/EC
  - Introduces an innovative concept called Digital Product Passports (DPP)
- **DPP:**
  - A digital identity file that is created by the manufacturer or retailer for each product, including the product's manufacturing details, supply chain information, environmental impact, and social responsibility practices.
  - The EU's first product digital passport, the Battery Digital Passport, will be mandatory for industrial and automotive batteries in 2027.



# DIGITAL PRODUCT PASSPORTS CAN ADDRESS THE CHALLENGES

- **Reduce Regulatory Barriers:** DPPs unify data formats and standards, easing regulatory coordination among member states and fostering data sharing.
- **Enhance Legal Framework Adaptability:** DPPs offer a flexible data-sharing framework that adapts to varying legal environments, simplifying legal harmonization.
- **Promote Cross-Sector Collaboration:** DPPs provide a unified product information platform, facilitating collaboration across sectors for a seamless circular economy transition.
- **Provide Infrastructure:** DPPs drive the development of digital infrastructure, reducing costs and overcoming technical barriers with technical support.
- **Foster Standardization:** DPPs promote the unification of data standards and compliance requirements across the EU, easing compliance challenges.



## CONCLUSION

- Digitalization is a catalyst for the circular economy, enhancing resource efficiency and reducing waste.
- The EU's legal frameworks, play a crucial role in shaping sustainable practices.
- DPPs are innovative, simplifying regulatory compliance and unifying product lifecycle management.
- Integrating digitalization and the circular economy requires addressing regulatory barriers, legal adaptability, and cross-sector collaboration.
- The EU's strategy, with its focus on digital innovation and sustainability, positions it as a leader in the global transition towards a greener economy.





**THANK YOU!**  
**ANY QUESTIONS!**

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