



PLANETWISE

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## Module 01: Circular Economy and Innovation in Practice

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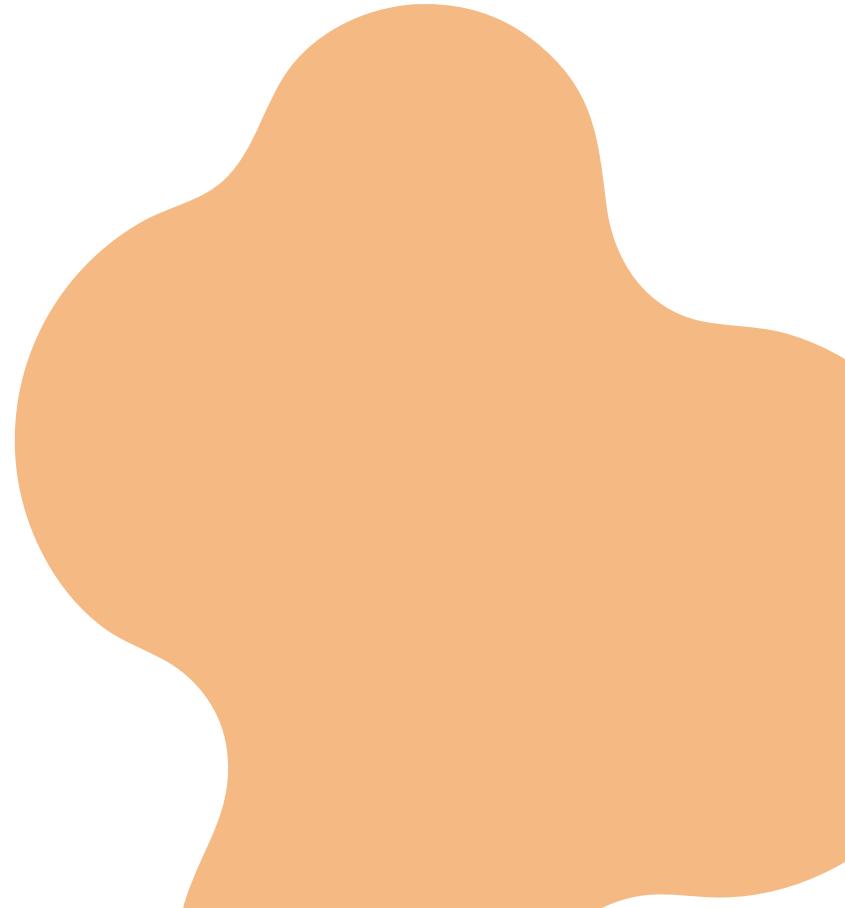


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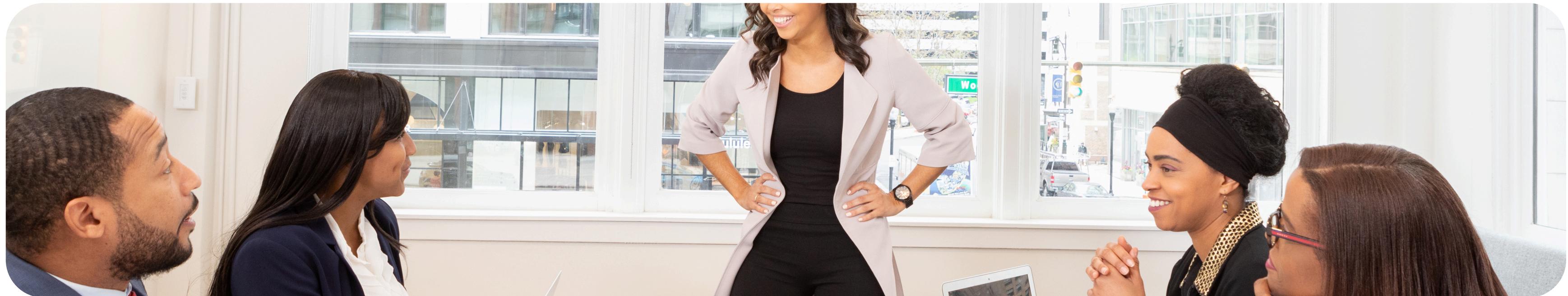
## Introduction to the Circular Economy



The circular economy is a forward-thinking model that reimagines production and consumption systems by eliminating waste and maximizing the value of materials. Unlike the traditional linear economy, which follows a “take-make-dispose” path, circularity encourages cycles where products, components, and resources are reused and regenerated. This paradigm shift not only reduces environmental harm but also supports long-term economic sustainability, making it a vital concept for businesses, governments, and communities aiming for responsible growth.

# Foundations of Closed-Loop Design

Closed-loop design is a foundational principle of the circular economy, focusing on creating products and services with their entire lifecycle in mind. Designers are challenged to think beyond the point of sale to how a product will be reused, repaired, or reintegrated into the production process. This approach encourages innovation in materials and systems, aiming for zero waste while increasing the longevity, reparability, and recyclability of everything we make and use.



## Core Pillars of Closed-Loop Design

Designing for a closed-loop system involves applying specific principles to ensure that a product stays within a sustainable material cycle. These design choices enable a shift from resource extraction to regeneration.

- Design out waste and pollution
- Keep products and materials in use
- Regenerate natural systems
- Use mono-materials for easier recycling
- Prioritize modular and repairable components

These strategies promote products that serve multiple life cycles and reduce reliance on virgin materials.



## Integrating Systems Thinking

To adopt closed-loop design effectively, systems thinking is crucial. This means understanding how products interact within broader networks supply chains, ecosystems, and end-user behaviors. By mapping these relationships, designers and businesses can identify intervention points where waste can be eliminated or resources reused. Viewing the economy as a set of interconnected systems, rather than isolated components, empowers more resilient and regenerative solutions that are aligned with natural cycles and long-term sustainability goals.

## ► Value of Circular Design Innovation

Innovative approaches in circular design not only support environmental goals but also unlock competitive advantages. Businesses that embed circularity in their models often see reduced material costs, enhanced brand loyalty, and improved regulatory compliance. Circular innovation encourages companies to rethink ownership, leasing, and service-based models, allowing them to capture new revenue streams while reducing their ecological footprint. The value lies not just in material recovery, but in reimagining the relationship between products and users.



## Hands-On Workshop: Mapping Material Flows

In this practical session, participants engage in tracing the journey of materials through various systems—businesses, campuses, or communities. Material flow mapping helps uncover hidden inefficiencies and identifies where interventions can enhance circularity. By following materials from extraction to disposal, users gain insights into consumption patterns and environmental impacts. This hands-on exercise fosters a deep understanding of the potential for closed-loop systems and encourages creativity in addressing real-world resource challenges.

# Steps in Material Flow Mapping

Mapping the journey of materials involves carefully analyzing how resources enter, move through, and exit a system. The process helps identify points of waste and opportunities for circular redesign.

- Identify material inputs and outputs
- Track lifecycle stages (production, use, disposal)
- Highlight waste generation points
- Pinpoint reuse, recycling, or recovery options
- Propose strategies for reduction or substitution

This approach builds a foundation for data-driven decisions and sustainable system redesign.



## ► Digital Tools to Support Mapping

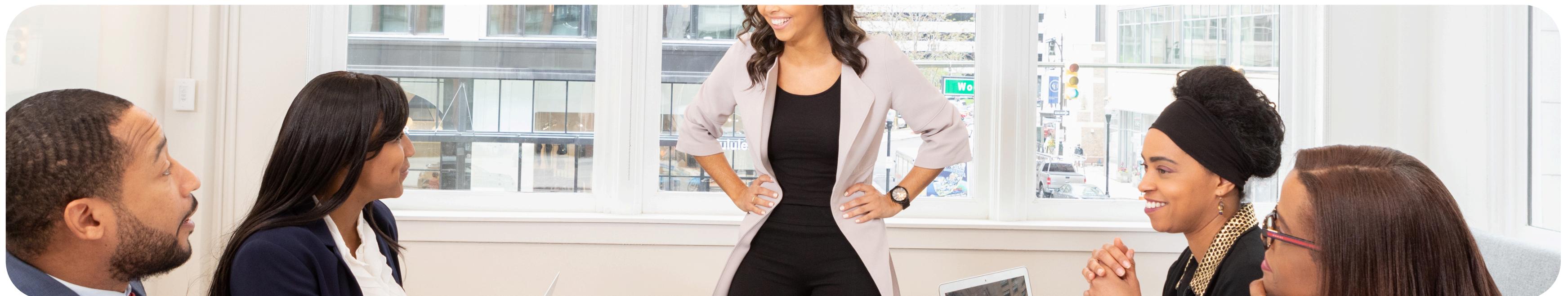
Using digital tools can greatly enhance the accuracy and visualization of material flow maps. Life Cycle Assessment (LCA) software, Material Flow Analysis (MFA), and circularity calculators are essential in determining resource intensity and environmental impact. By incorporating these tools, participants can identify hotspots where material efficiency can be improved. Such platforms not only increase transparency across supply chains but also enable stakeholders to simulate and plan for circular alternatives more effectively.

## Real-World Impact of Flow Mapping

Material flow mapping has helped many organizations rethink how they manage inputs and outputs. In manufacturing, it often leads to reduced scrap, more efficient logistics, and better material selection. In municipal systems, such exercises help identify recyclable streams in urban waste. By turning hidden flows visible, flow mapping empowers users to make sustainable choices, transforming waste into resources and revealing innovative pathways toward more circular business practices.

## Case Study: Upcycled Start-Ups

Upcycled start-ups take discarded or undervalued materials and transform them into high-quality, marketable goods. These businesses embody the essence of circularity, often merging design, sustainability, and social impact. Whether it's converting textile offcuts into fashion or using reclaimed wood for furniture, these ventures challenge linear consumption. They add value by telling stories through their products, which often attract eco-conscious consumers and demonstrate how entrepreneurship can align with environmental stewardship.





## Turning Waste into Wearables

An example of successful upcycling is a company that turns discarded rubber tires into durable, fashionable footwear. This innovation addresses waste and creates employment in underserved areas.

- Source: Discarded vehicle tires
- Product: Shoes with long lifespans
- Market: Eco-conscious urban consumers
- Impact: Diverted waste and local job creation
- Model: Direct-to-consumer with social storytelling

This approach turns pollution into purpose while supporting community-driven innovation.



## Advantages of Upcycled Business Models



Upcycling businesses benefit from reduced material costs, brand differentiation, and growing consumer demand for sustainable goods. These advantages make them more resilient in fluctuating markets. By sourcing waste as their input, these companies lower overhead while increasing product uniqueness. They also align with policy shifts and customer preferences favoring low-impact alternatives. Moreover, upcycled products often have built-in marketing value due to their origin stories, which deepen customer engagement and brand loyalty.

## Challenges Faced by Upcycling Ventures

While upcycling is promising, it comes with challenges such as inconsistent material quality, labor-intensive production, and scalability limitations. Sourcing enough uniform waste material can be difficult, especially for growing companies. Customizing products from waste often requires more manual labor, increasing time and cost. Additionally, consumers may be unfamiliar with upcycled products, requiring educational marketing efforts. Overcoming these hurdles requires innovation, strategic partnerships, and efficient operations to remain competitive in broader markets.

# Common Traits of Successful Circular Start-Ups

Circular start-ups often share common traits that contribute to their impact and resilience:

- Strong mission-driven branding
- Transparent supply chains
- Community involvement and stakeholder buy-in
- Scalable yet flexible production models
- Data-driven measurement of sustainability outcomes

These characteristics enable them to adapt quickly and attract both customers and investors interested in long-term sustainability.



# Local Waste Audit Toolkit Overview

The Local Waste Audit Toolkit is a comprehensive set of tools designed to help schools, offices, or neighborhoods evaluate their waste output and identify actionable solutions. It offers templates, step-by-step guidance, and calculators to estimate waste volume and composition. The toolkit allows users to assess behaviors, track progress over time, and develop localized circular strategies. It transforms waste from a hidden problem into an opportunity for systemic change through community-based participation and insight.



## ► What the Toolkit Includes

A waste audit is more effective with a structured, easy-to-follow toolkit. Most toolkits include:

- Sorting guides for different waste types
- Templates for data collection and analysis
- Checklists for material tracking
- Tools to weigh and measure outputs
- Suggestions for post-audit solutions

These tools empower users to conduct meaningful audits and design community-specific interventions.





## How to Conduct a Waste Audit

Conducting a waste audit requires organization, safety precautions, and teamwork. First, identify the audit site and assemble your team. Collect and categorize waste over a defined period, then weigh and log each type. Clean data allows for analysis and helps uncover where waste is being generated unnecessarily. Use the findings to inform action plans, such as composting initiatives or source reduction strategies. Follow-up audits help measure progress and refine goals over time.

# Lessons from Community-Based Audits

Audits conducted in local settings often reveal surprising patterns in behavior. For instance, many offices discard recyclable items due to confusion over sorting rules. Some households generate large volumes of food waste due to over-purchasing. By sharing findings, communities can raise awareness and tailor education campaigns. Audits also create ownership and engagement, especially when solutions involve collective action, such as neighborhood composting or improved signage for shared waste bins.

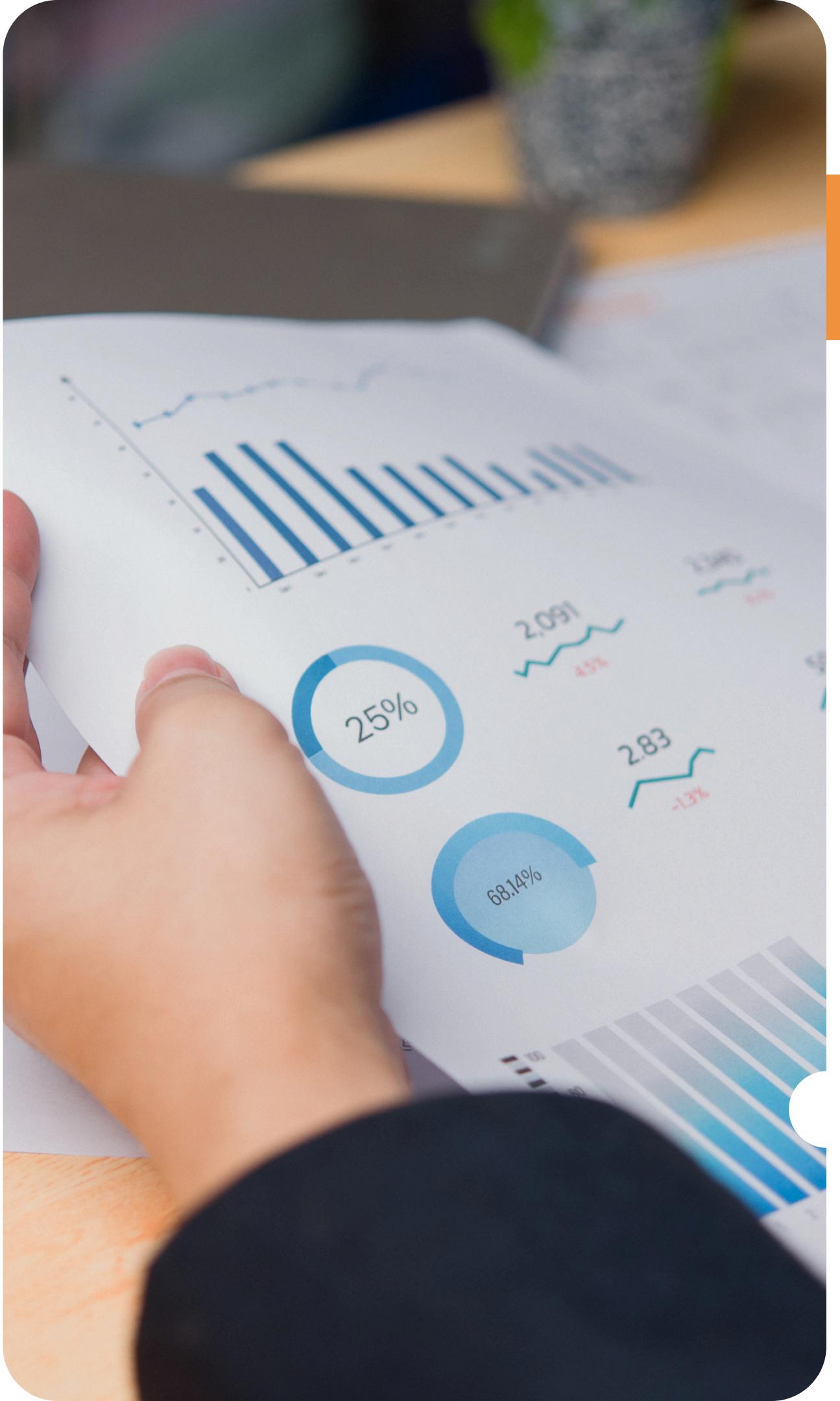


# Barriers to Effective Waste Auditing

Despite their value, waste audits are sometimes underused due to several barriers:

- Lack of resources or staff availability
- Difficulty accessing or storing waste
- Limited expertise in data interpretation
- Inconsistent participation from users
- Absence of follow-up systems

Addressing these issues requires simplifying the process, offering incentives, and integrating auditing into broader environmental strategies.



## Using Data for Circular Solutions

Once audit data is collected, it becomes a springboard for broader sustainability initiatives. The insights gained can inform purchasing policies, packaging redesign, and awareness campaigns. By identifying what materials are most commonly wasted, businesses can reconsider sourcing decisions. Schools and communities may introduce composting or refill stations. Turning audit results into action closes the loop between information and impact, helping to build a culture of continuous improvement and circular awareness.

## Pitch & Feedback Session Explained

The Pitch & Feedback session is a collaborative space where learners present their circular innovation ideas and receive feedback from mentors, peers, or judges. This session fosters a learning culture rooted in support, constructive criticism, and cross-pollination of ideas. It helps participants refine their business models, build confidence in storytelling, and anticipate questions from future investors or partners. The environment prioritizes growth, encouraging clarity, feasibility, and sustainability in all proposed solutions.

## Components of a Circular Pitch

Constructive feedback is vital to the pitch process. Reviewers should offer insights that challenge assumptions and support idea refinement. Good feedback:

- Encourages critical thinking, not just compliments
- Focuses on impact, feasibility, and clarity
- Suggests resources, partnerships, or tweaks
- Avoids personal bias and emphasizes the pitch's goals

Effective feedback improves the outcome and boosts confidence in presenters.



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## Trends in Circular Innovation

Recent pitch sessions have featured ideas in sustainable packaging, modular furniture, and food rescue platforms. These trends reflect broader concerns about plastic waste, fast fashion, and food insecurity. Innovations are increasingly integrating digital platforms, local supply chains, and social equity. As awareness grows, pitches also include policy engagement, such as carbon labeling or zero-waste certifications. This evolution indicates that circularity is expanding beyond products into systems and governance.

## Outcomes from the Pitch Experience

Many participants leave pitch sessions with renewed motivation and clearer strategies. The process not only highlights areas of weakness but also builds momentum. Receiving diverse perspectives enables better communication of ideas, sharper focus on key benefits, and improved alignment with user needs. Participants often develop partnerships or attract interest from investors, mentors, or collaborators. These experiences lay the groundwork for bringing circular innovations to life beyond the classroom or workshop.



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## Activity Name: “Trash to Treasure Challenge”

Type: Group-based, hands-on, creative

Duration: 1.5 to 2 hours

Materials: Clean recyclable waste (bottles, cartons, fabric scraps, old electronics, etc.), scissors, glue, markers, string, tape, cardboard, etc.

Objective:

Transform everyday “waste” into a functional or artistic product that represents the principles of the circular economy—reusing materials, closing loops, and adding value.



## Activity Name: “Trash to Treasure Challenge”



### Instructions:

1. Form teams of 3–5 participants.
2. Each team receives a pile or selection of clean discarded materials.
3. Teams have 60–75 minutes to brainstorm, design, and build a functional product or artistic piece using only the materials provided.

At the end, each team does a 5-minute show-and-tell, explaining:

- What they made
- What problem it solves or what message it sends
- How it connects to circular economy principles





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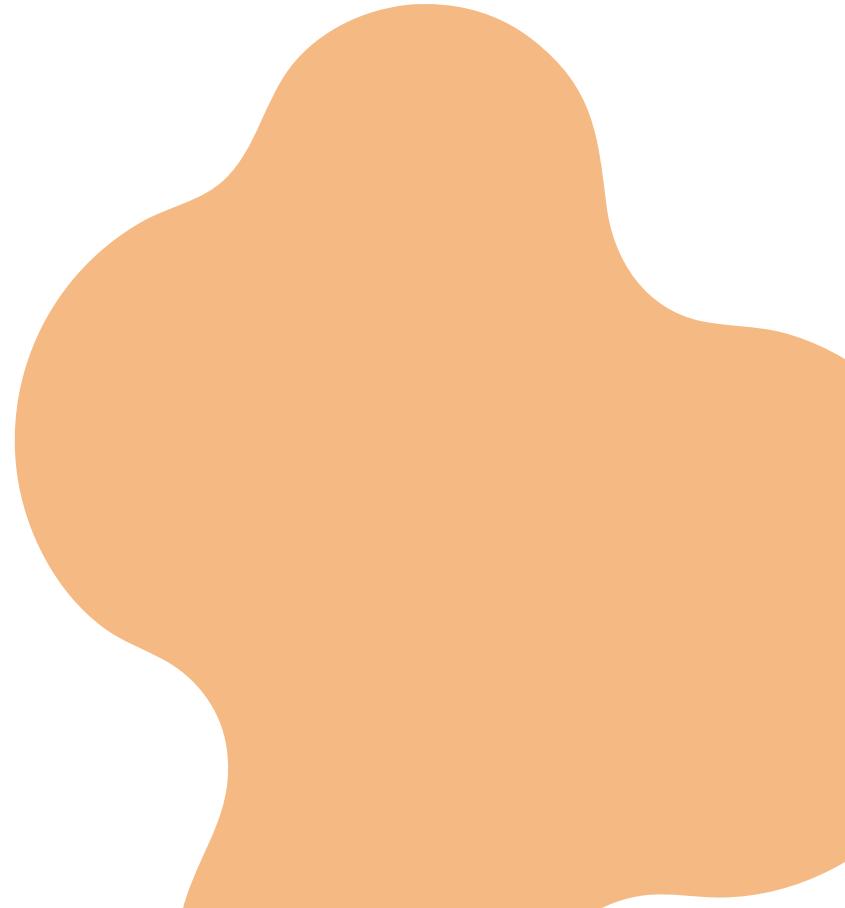
### Debrief Questions (15–20 minutes):

- What challenges did you face while using only waste materials?
- How did this change your perspective on the value of waste?
- What would need to happen to scale your idea in real life?
- How can creativity play a role in circular design and innovation?

### Optional Twist:

Run it as a friendly competition where teams vote (anonymously) for:

- “Most Circular Design”
- “Most Useful Product”
- “Best Story or Pitch”





# Thank You

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