

Introduction to Circular Economy

Managing Circular Economy

Samuli Patala

27.02.23



Aalto University
School of Business



Teachers



Samuli Patala
Assistant Professor
Research interests:
circular economy,
sustainable business,
collaboration for
sustainability



Iqra Khan
Postdoctoral researcher
Research interests:
circular economy,
sustainability, industry
4.0

Course background

Circular economy has been a key interest in the Sustainability in Business –research group for several years now

Pre-2019: circular economy as a one focus area in few projects

2019: Finix –project started, focusing on circularity in textiles

2019-2022: Kiertotalouden strategiat ja johtaminen (B.Sc. Course) taught by Olli Sahimaa

2023: New course in English



FINIX

Your background and motivations

Which study background / major?

Why are you interested in this course?

Discuss in pairs

Overview of today

Introduction

Basic concepts of circular economy

Drivers to circularity

Course outline and format

Practicalities

Examples of circular business models

TOUCHPOINT

Sustainable Workwear



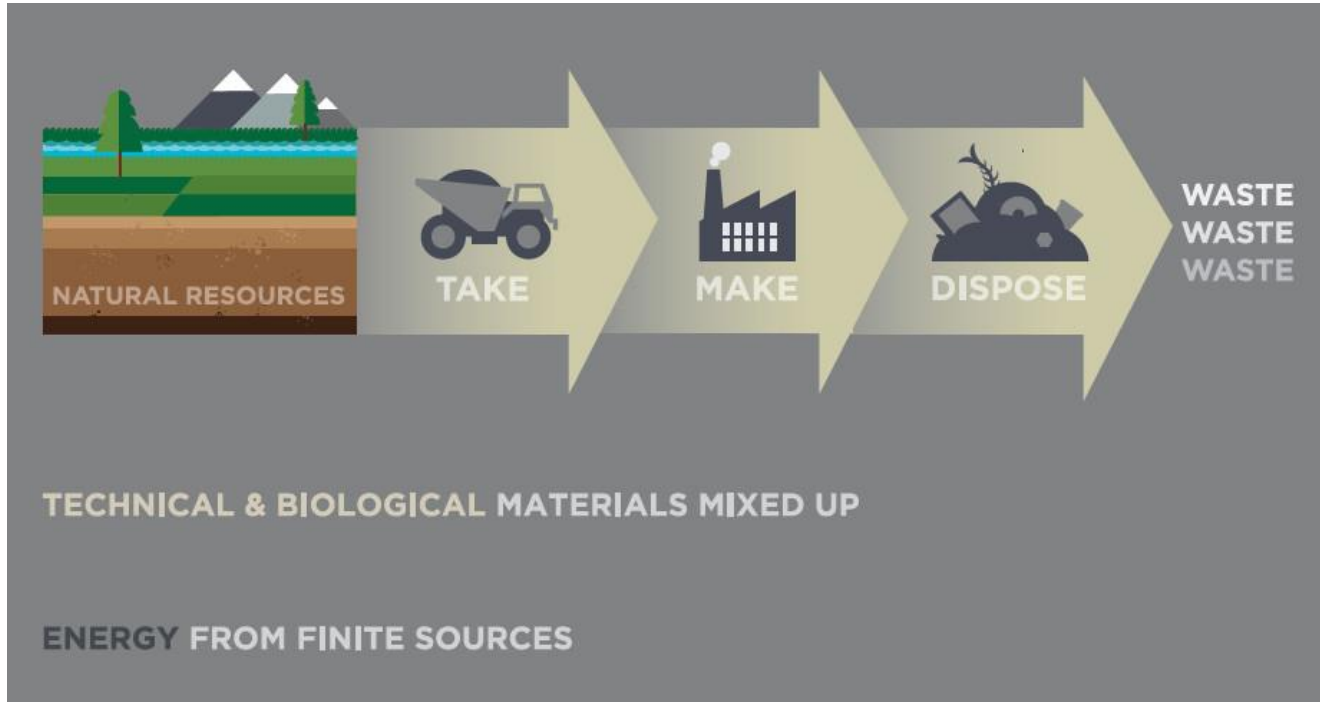
PURE WASTE

100% RECYCLED TEXTILES



VAATEPUU

The linear economy





Drivers to circular economy



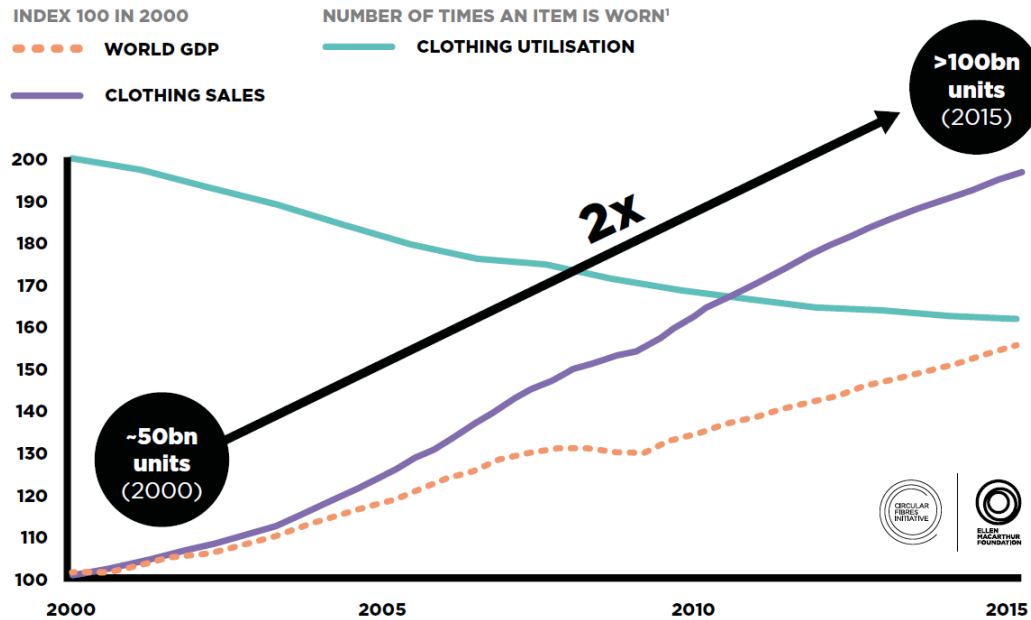
Aalto University
School of Business

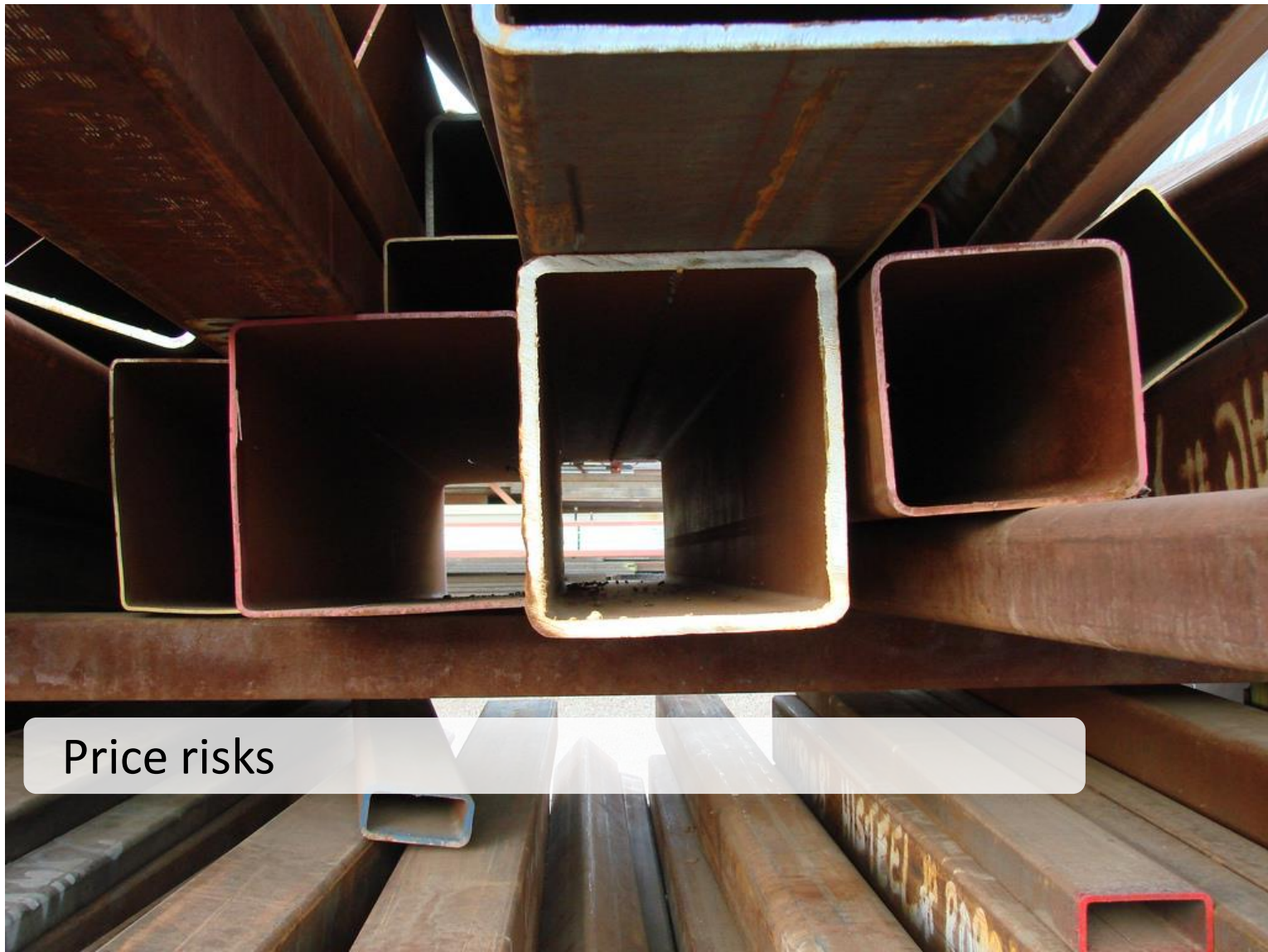


- In EU (2015):**
- the average car is parked 92% of the time
 - 31% of food is wasted along the value chain
 - the average office is used only 35–50% of the time

Economic losses and structural waste

Example – textile industry





Price risks

Price risks

How the lumber industry misread Covid and ended up with a global shortage and sky-high prices

“Whoever is a lumber producer today is making a fortune.”

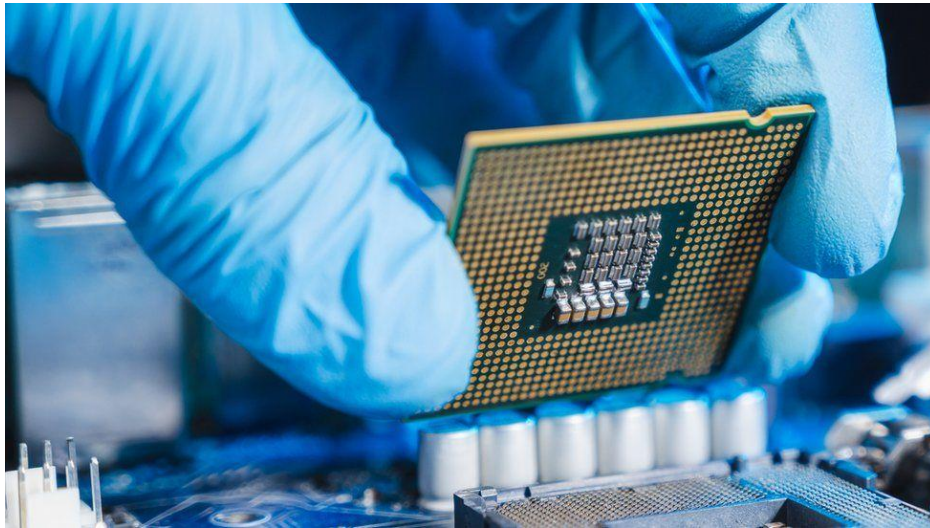




MSC

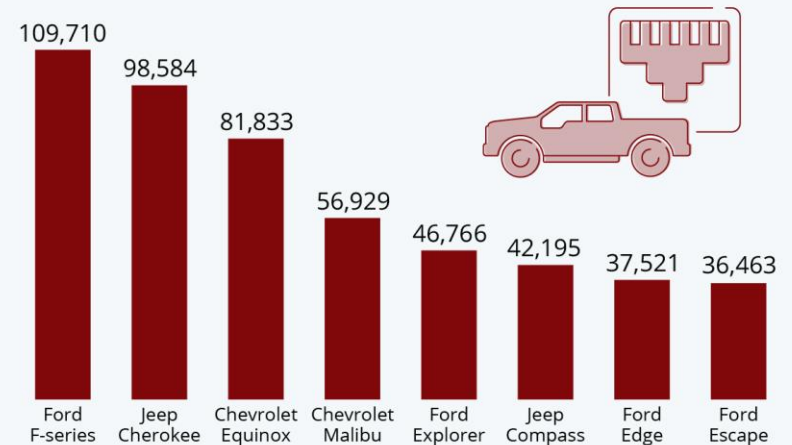
Supply risks

Supply risks



The U.S. Car Models Worst Hit By The Microchip Shortage

Estimated number of vehicles taken out of production due to microchip shortages (as of May 2021)



Source: Automotive News via Car and Driver



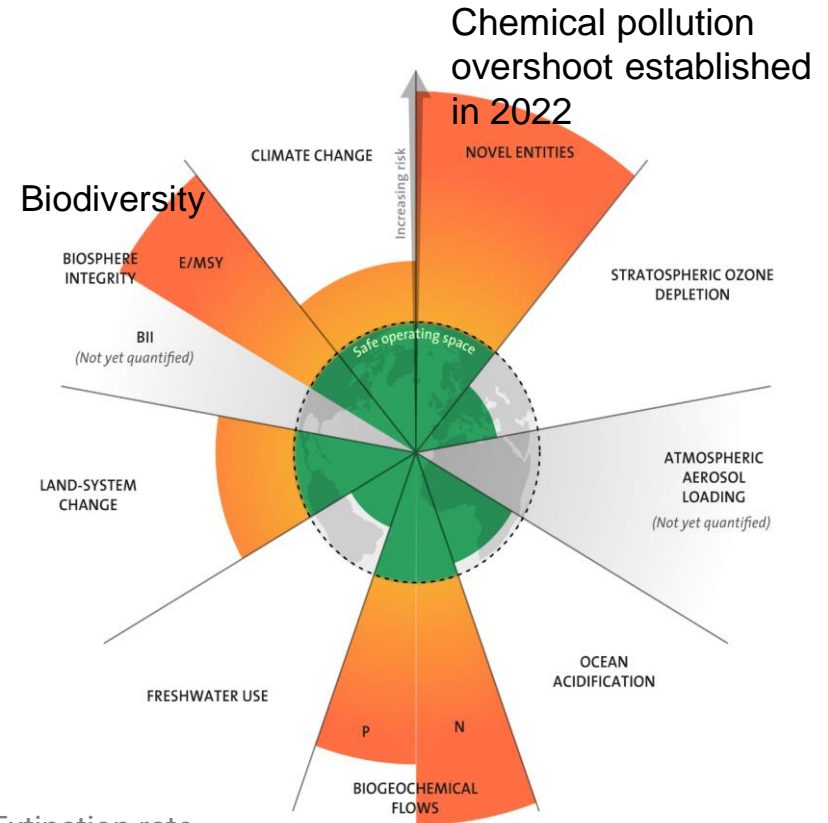
statista



Natural systems degradation

Planetary boundaries

- Estimates 9 planetary boundaries:
Green indicates safe operating space, **orange** increasing risk, and **red** a high risk.
- The planetary boundaries are at the scale of the planet.
- For the shared global boundaries, like climate change, the challenge is bridging the gap between local action and these global problems.



Genetic diversity: Extinction rate

Functional diversity: Biodiversity Intactness Index (BII)

E/MSY = extinctions per million species-years

Beyond boundary
– risk zone

Sustainable development



SUSTAINABLE DEVELOPMENT GOALS

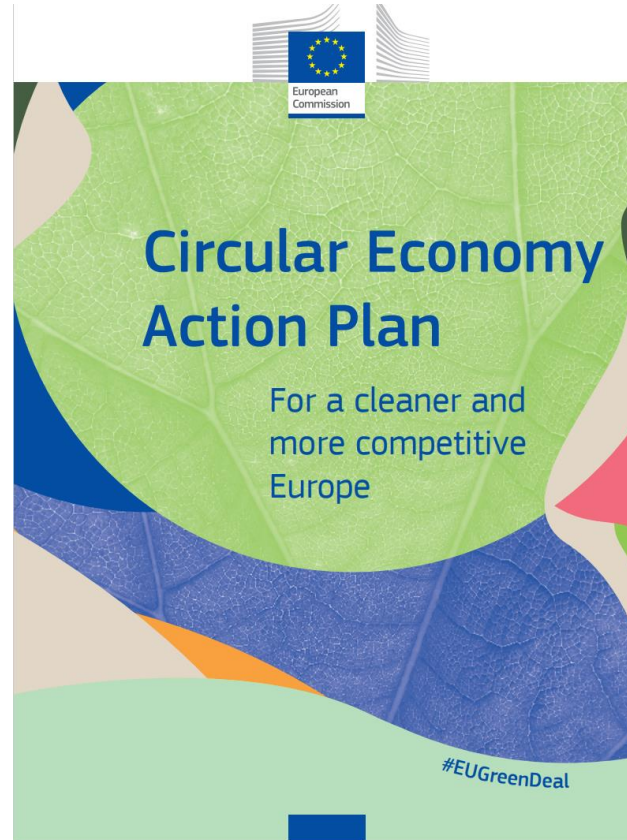
17 GOALS TO TRANSFORM OUR WORLD





Regulatory trends

Regulatory trends



Drivers for change

Challenges



ECONOMIC LOSSES & STRUCTURAL WASTE



PRICE RISKS



SUPPLY RISKS



NATURAL SYSTEMS DEGRADATION



REGULATORY TRENDS

Enablers



ADVANCES IN TECHNOLOGY



ACCEPTANCE OF ALTERNATIVE BUSINESS MODELS



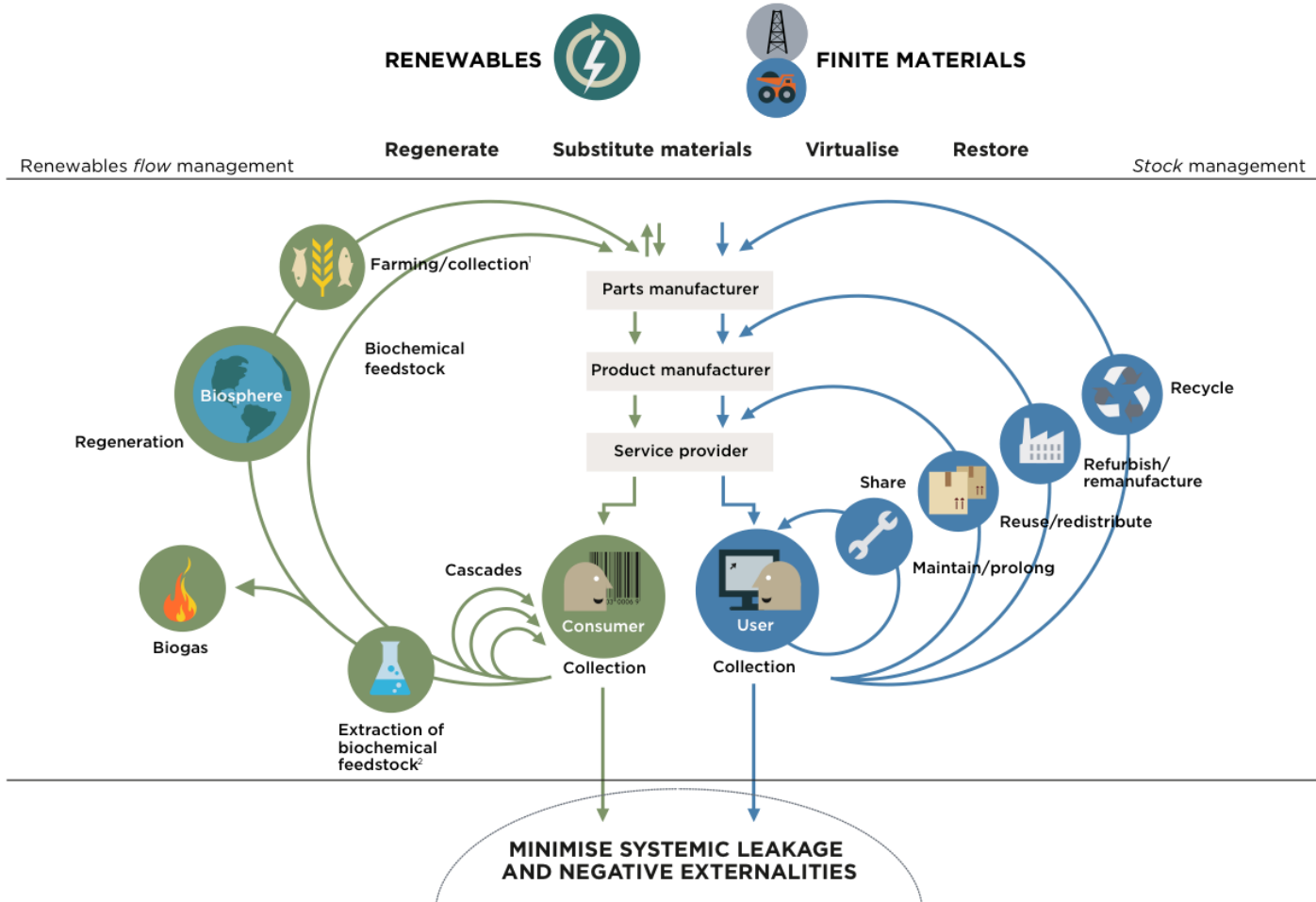
URBANISATION

SOURCE: Ellen MacArthur Foundation, SUN, McKinsey Center for Business and Environment - Growth Within: a circular economy vision for Europe

WHAT IS A CIRCULAR ECONOMY?

“A circular economy is one that is restorative and regenerative by design, **and which aims to keep products, components and materials at their highest utility and value at all times**, distinguishing between technical and biological cycles.”

Source: Ellen MacArthur Foundation



SOURCE: Ellen MacArthur Foundation; drawing from Braungart & McDonough Cradle to Cradle (C2C)

Discussion

Definite these terms (in pairs)

Recycling

Remanufacturing

Redistribution

Repair

Refurbish

Cascading of components and materials

Product service systems / product-as-a-service

Reverse logistics

Definitions

Recycling

- A process of recovering materials for the original purpose or for other purposes, excluding energy recovery.
- Downcycling- A process of converting materials into new materials of lesser quality and reduced functionality.
- Upcycling- A process of converting materials into new materials of higher quality and increased functionality.

Remanufacturing

- A process of disassembly and recovery at the subassembly or component level. Functioning, reusable parts are taken out of a used product and rebuilt into a new one. This process includes quality assurance and potential enhancements or changes to the components.

Definitions

Redistribution

- To find a new market or user for a product already in use.

Repair

- Maintaining a product in order to extend its useful life.

Definitions

Refurbish

- A process of returning a product to good working condition by replacing or repairing major components that are faulty or close to failure, and making 'cosmetic' changes to update the appearance of a product, such as cleaning, changing fabric, painting or refinishing. Any subsequent warranty is generally less than issued for a new or a remanufactured product, but the warranty is likely to cover the whole product (unlike repair). Accordingly, the performance may be less than as-new.

Cascading of components and materials

- Putting materials and components into different uses after end-of-life across different value streams and extracting, over time, stored energy and material 'coherence'. Along the cascade, this material order declines (in other words, entropy increases).

Definitions

Product service systems / product-as-a-service

- Where manufacturers or retailers retain ownership of their products (or have an effective take-back arrangement) and, where possible, act as service providers, selling the use or performance of products, not their consumption.

Reverse logistics

- A collection and return system that aims to increase materials productivity by reworking end-of-life products.

Course outline and practicalities



Aalto University
School of Business

Schedule

#	Date	Topic	Room
Week 1: The fundamentals of circular economy			
1	27.02.23	Lecture – Introduction to circular economy – key concepts and drivers	U356 (Alma Media)
2	02.03.23	Exercise: Guided introduction to group work	U119 (Deloitte)
Week 2: Circular economy and systems thinking			
3	06.03.23	Lecture: Introduction to systems thinking, CE as a systemic issue	U356 (Alma Media)
4	09.03.23	Exercise: Systems thinking assignment	U119 (Deloitte)
Week 3: Strategies and business models for circularity			
5	13.03.23	Lecture: Circularity strategies and business models	U356 (Alma Media)
6	16.03.23	Exercise: Circular experimentation workbench	U119 (Deloitte)
Week 4: Circular economy ecosystems			
7	20.03.23	Lecture: The role of collaboration for circular economy	U356 (Alma Media)
8	23.03.23	Exercise: Circular collaboration canvas	U356 (Alma Media)
Week 5: Circular economy and the role of new technologies			
9	27.03.23	Guest lecture: Digital technologies and circular economy	U119 (Deloitte)
10	30.03.23	Exercise: CE and new technologies	U356 (Alma Media)
Week 6: Circular economy and the society			
11	03.04.23	Lecture: Circular economy and policy development, critical views of CE	U356 (Alma Media)
12	13.04.23	Summary and wrap-up	U356 (Alma Media)



Course work and grading

Component	Grading
Learning diaries	30%
Group assignment	40%
Attendance	30% (+extra credit)

Learning diaries

- **Reflections submitted at the end of each teaching week (6 total)**
 - Based on lectures, exercise sessions and weekly readings.
 - More details in syllabus
- **500-800 words in length (each)**
- **Submitted at the end of each course week**
- **Grade: 0-2 points each**

Group assignment

- **Group assignment focusing on circular economy development in a company**
- **Groups of 4-5 students**
- **More details are provided in the syllabus and on Thursday's session**

Thank you!



Aalto University
School of Business

Session #2

Circularity and sustainability

Group work



Aalto University
School of Business

02.03.2023

Outline

Circularity and sustainability – discussion

Introduction to group work

Forming groups and identifying a case company to focus on

Discussion 1

What do you identify as the main differences between the concepts of circular economy and sustainability?

Where do you see the biggest potential of CE to contribute to sustainability? In which areas is the CE-sustainability link weaker?

Introduction to group work



Aalto University
School of Business

Group assignment

- **Circular business development case study**
- **Objective: analyze a chosen firm and propose options for circular business development**

Guided group discussions



Aalto University
School of Business

Form into the groups you signed up for

2 exercises:

