

Sustainable circular economy

Agenda

- Drivers of circular economy
- Basics of circular economy
- Critical evaluation of circular economy
- In-class task

What is circular economy?

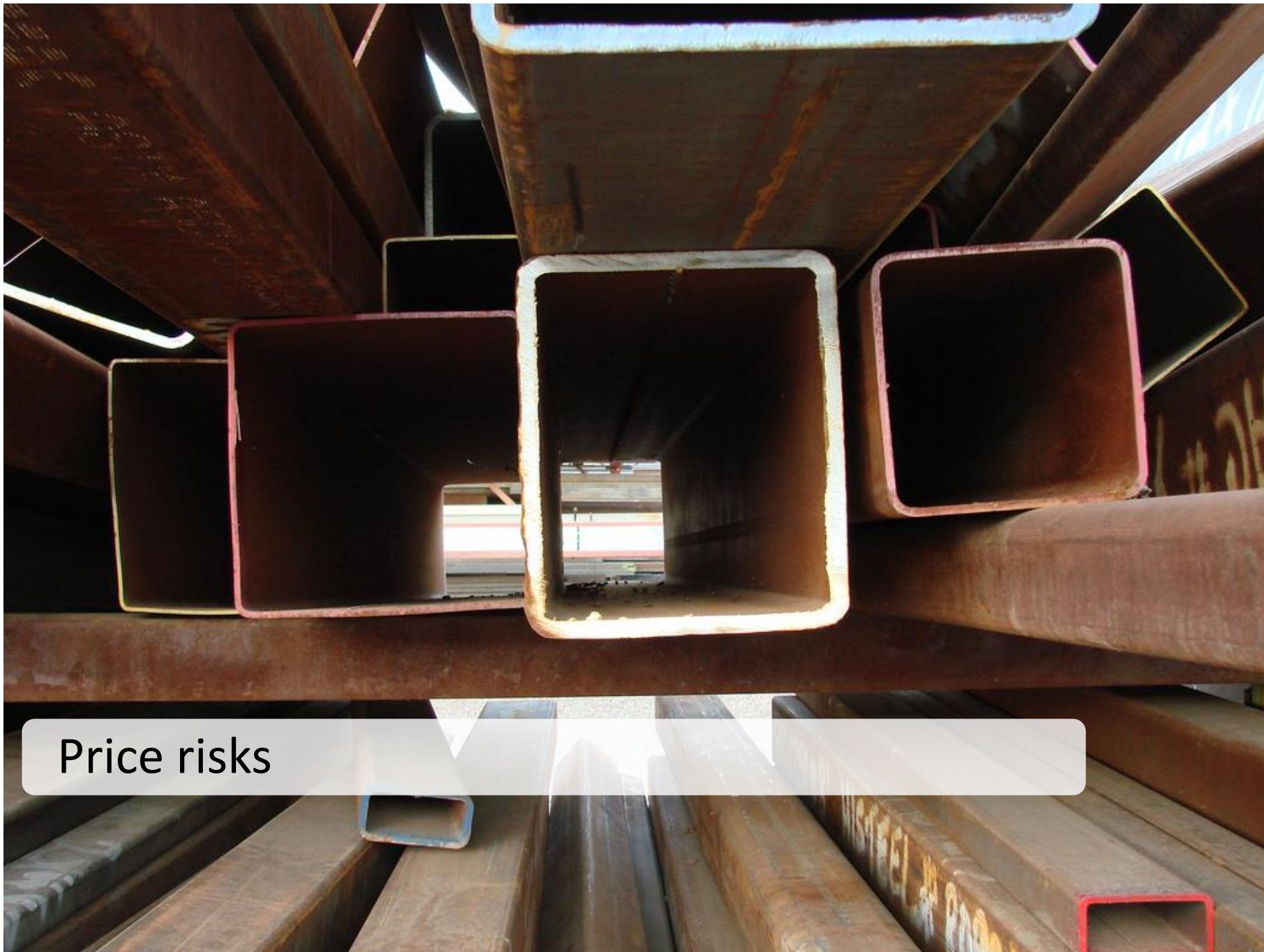
- “A circular economy is one that is restorative and regenerative by design, and which aims to keep products, components and materials at their highest utility and value at all times, distinguishing between technical and biological cycles.”
- A system where resources are utilized in a way in which use of raw materials is reduced through reuse and recycling
 - From take-make-waste to reduce-reuse-recycle
 - Imitate biological loops in technical loops

Drivers of circular economy



Economic losses and structural waste

- In EU:
- 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



Price risks



MSC

Supply risks



Natural systems degradation



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

Some basics of circular economy

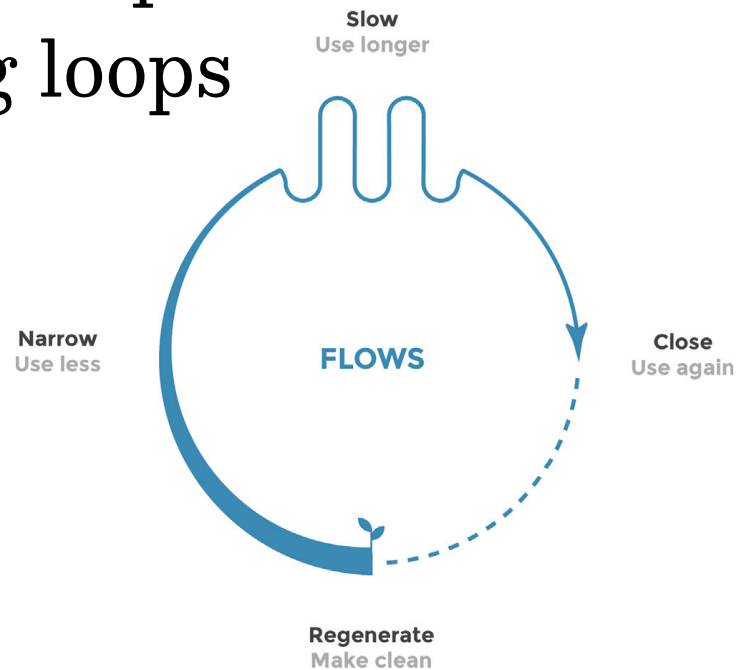
Basics of circular business models

Resource strategy

- Narrowing loops
- Closing loops
- Slowing loops

Innovation strategy

- Closed innovation
- Open innovation



Narrowing loops

Focus on resource-efficiency

Examples: Packaging reduction,
increased material use efficiency

Typically saves costs through
energy efficiency, reduced
manufacturing costs

NETFLIX

- Netflix entirely eliminated need for physical packaging in video entertainment

Closing loops

Focus on re-using materials

Examples: Product take-back schemes; material re-use, recycling; converting into energy...

Typically saves costs through

- Thousand Fell only uses recyclable, upcyclable, and biodegradable materials



Slowing loops

Focus on life-cycle length

Examples: Product durability and repairability, modularity

Tends to be costly, though possibility to attract customer segments that enable high margins

- Darn Tough makes socks with a lifetime guarantee
- Max. 3 fibers per sock
 - Improved recyclability



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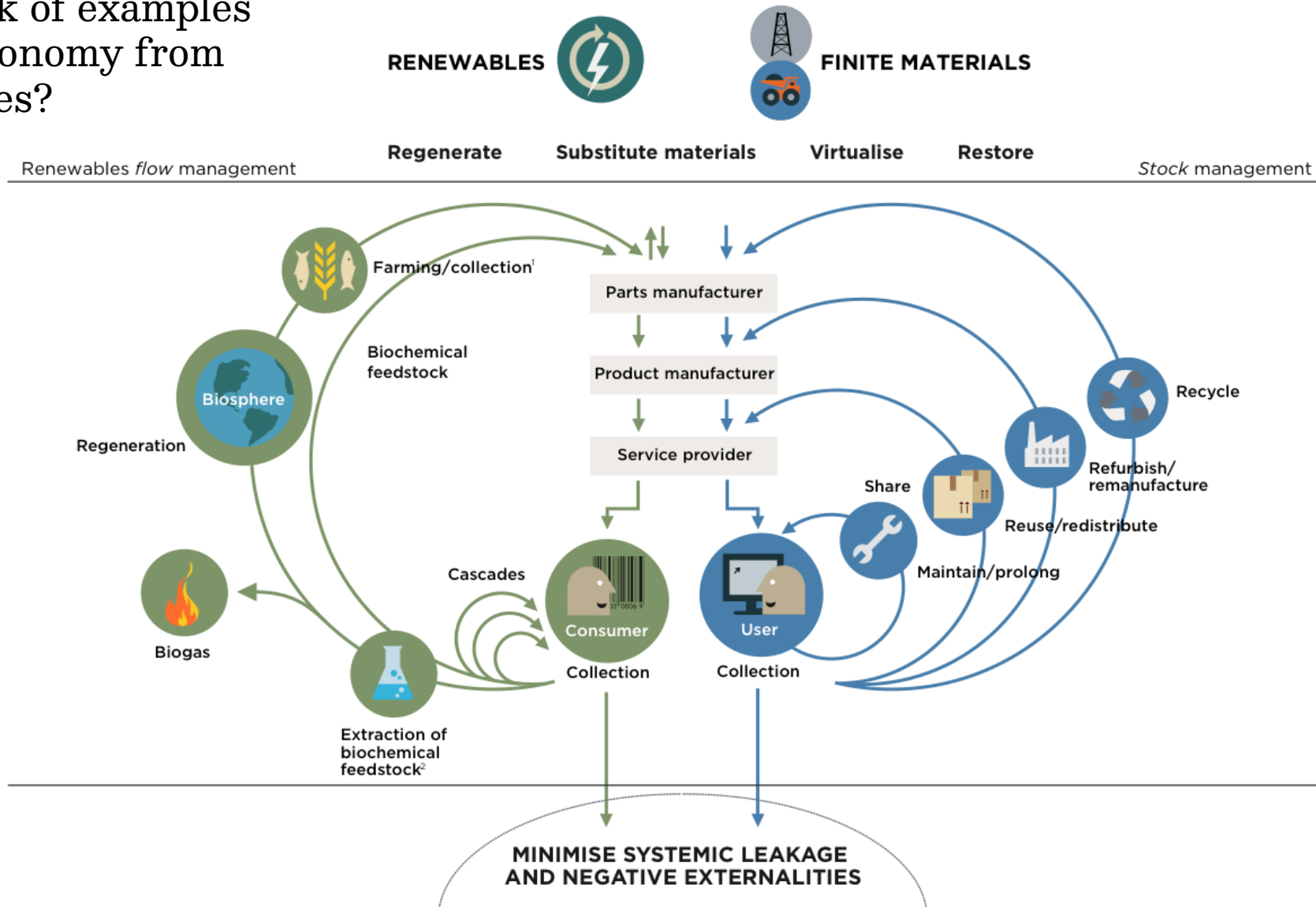
Closed innovation

- Organizing company internal processes according to circularity principles
- Interface and solar energy, material recycling...

Open innovation

- Collaborating to organize company ecosystem according to circularity principles
- Interface and new material designs and sourcing

Can you think of examples of circular economy from earlier lectures?



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

Taking a critical look

Why circular economy as such is not really enough

- At its core, CE is resource efficiency in new clothes
 - More of a weakly than strongly sustainable approach
 - Views the environment as a resource base rather than a system we're embedded in
- CE business models tend to be less circular in practice than promised
 - CE tends to become expensive after a point!
- Ever-increasing circular models will still require more resources to grow
- The problem with recycling is, it takes energy, and you can't maintain 100% efficiency

Making
circular
economy
strongly
sustainable

- At heart a radical concept aiming at critiquing established systems relations
 - But for circular economy to be sustainable, it needs the right principles to back it up
- Change the rules of the game!

Making
circular
economy
strongly
sustainable

- From closing material loops to connecting planetary boundaries and SDGs to economic thinking more broadly
- Reduction of consumption of raw materials is key
 - Not just circularity, but circularity with a smaller amount of resources consumed in general
 - Focus on prolonging product lives first, only then recycling efficiency
 - Slowing loops is imperative

Level the playing field

- Increase material quality requirements
 - Slows down loops
 - Include environmental externalities in pricing
 - Provide different boundary conditions for competition
 - Increase producer responsibility
 - Help including externalities in pricing
- These policy shifts would lead towards downscaling of production and consumption

References

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In-class task

Choose a case and:

- Apply the ReSOLVE framework (next slide) to assess circularity
 - Suggest improvements
- What about closing, narrowing, and slowing loops?

• Cases:

- Ikea
- Adidas
- Thousand Fell
- Interface
- Lego
- Renault

Business strategies for CE

The ReSOLVE framework

The ReSOLVE framework offers organisations a tool for identifying circular strategies and growth initiatives.

Each of the ReSOLVE levers represents a circular economy business opportunity by eliminating systemic waste.

