

Circular Economy and Sustainability Strategies



**UNIVERSITY OF
CAMBRIDGE**
Judge Business School

Circular Economy Business Models

Textile and Garment in Africa

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Twenty years after the first Rio Summit, the world continues to face a twin challenge:

- 1- Expanding economic opportunities for all in the context of a growing global population – this is happening in different industries and sectors
- 2- Addressing environmental pressures that, if left unaddressed, could undermine our ability to seize these opportunities.

Green growth is where these two challenges meet, and it is about exploiting the opportunities to realise the two together.

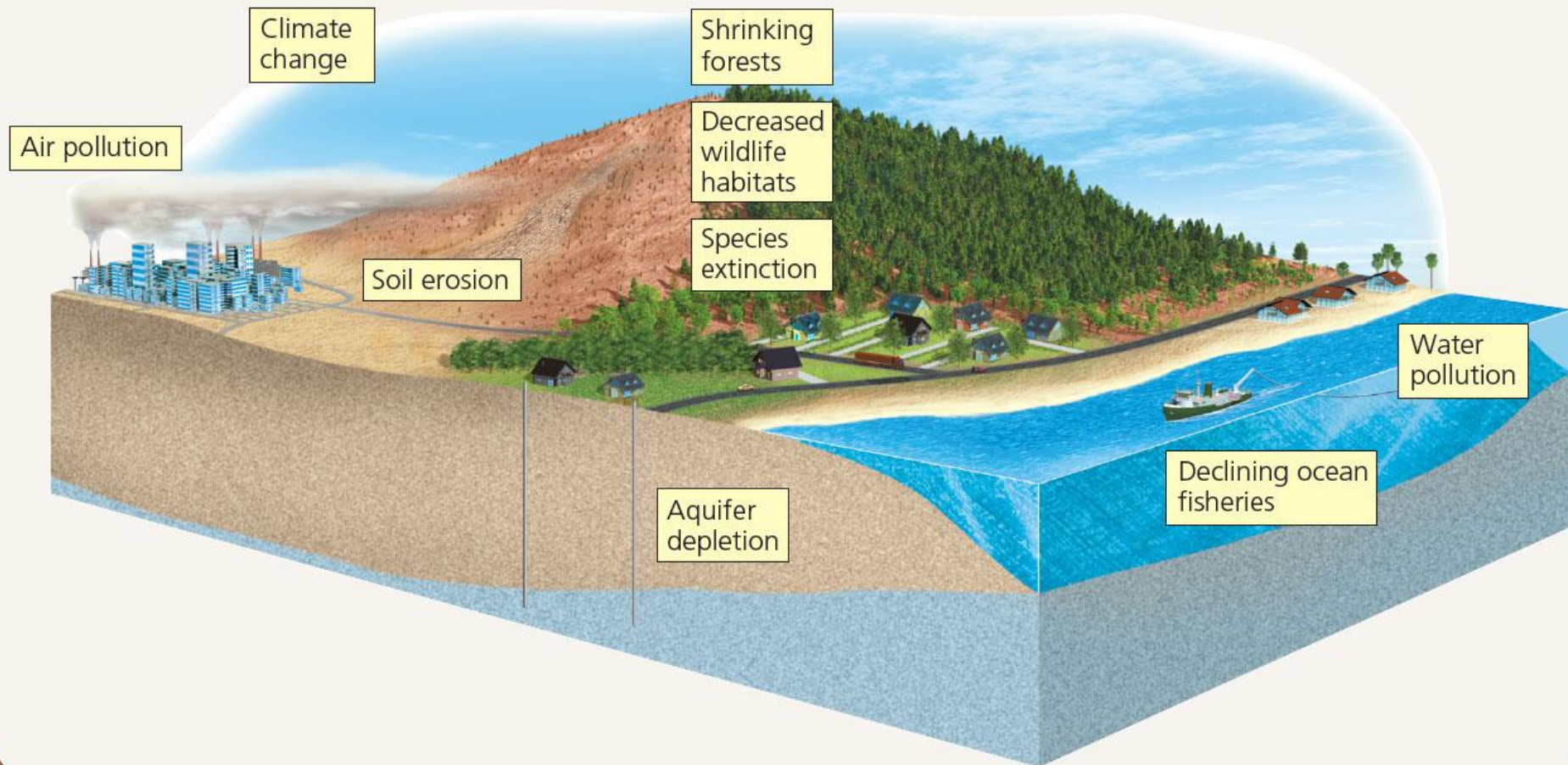
Green growth means fostering economic growth and development while ensuring that natural capital and assets continue to provide the resources and environmental services on which our well-being relies.

Need to examine and implement issues from a MACRO – MEZO – MICRO perspective.

Humans Degrade Natural Capital

Natural Capital Degradation

Degradation of Normally Renewable Natural Resources



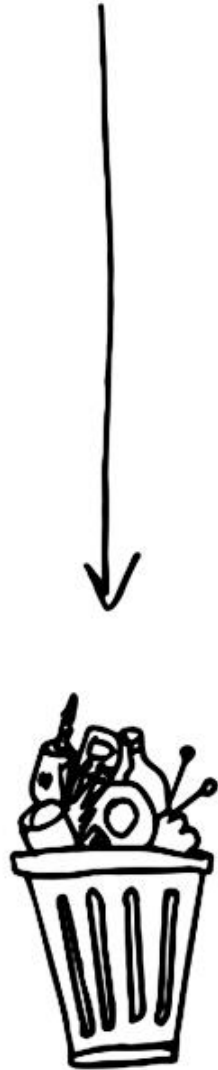
Circular Economy:

- A regenerative system where resources are continuously reused, and waste is minimized.
- Focuses on designing out waste, keeping materials in use, and regenerating natural systems.

• Relevance to Textiles and Garments:

- The textile industry is one of the most resource-intensive and polluting industries globally.
- Circular economy can help address issues like waste, pollution, and unsustainable production practices.
- **Circular economy business models in the textile and garment industry** focusing on **POP(Persistent Organic Pollutants) -free manufacturing** and the **implementation of Best Available Techniques (BAT)/Best Environmental Practices (BEP)**

LINEAR ECONOMY



RECYCLING ECONOMY

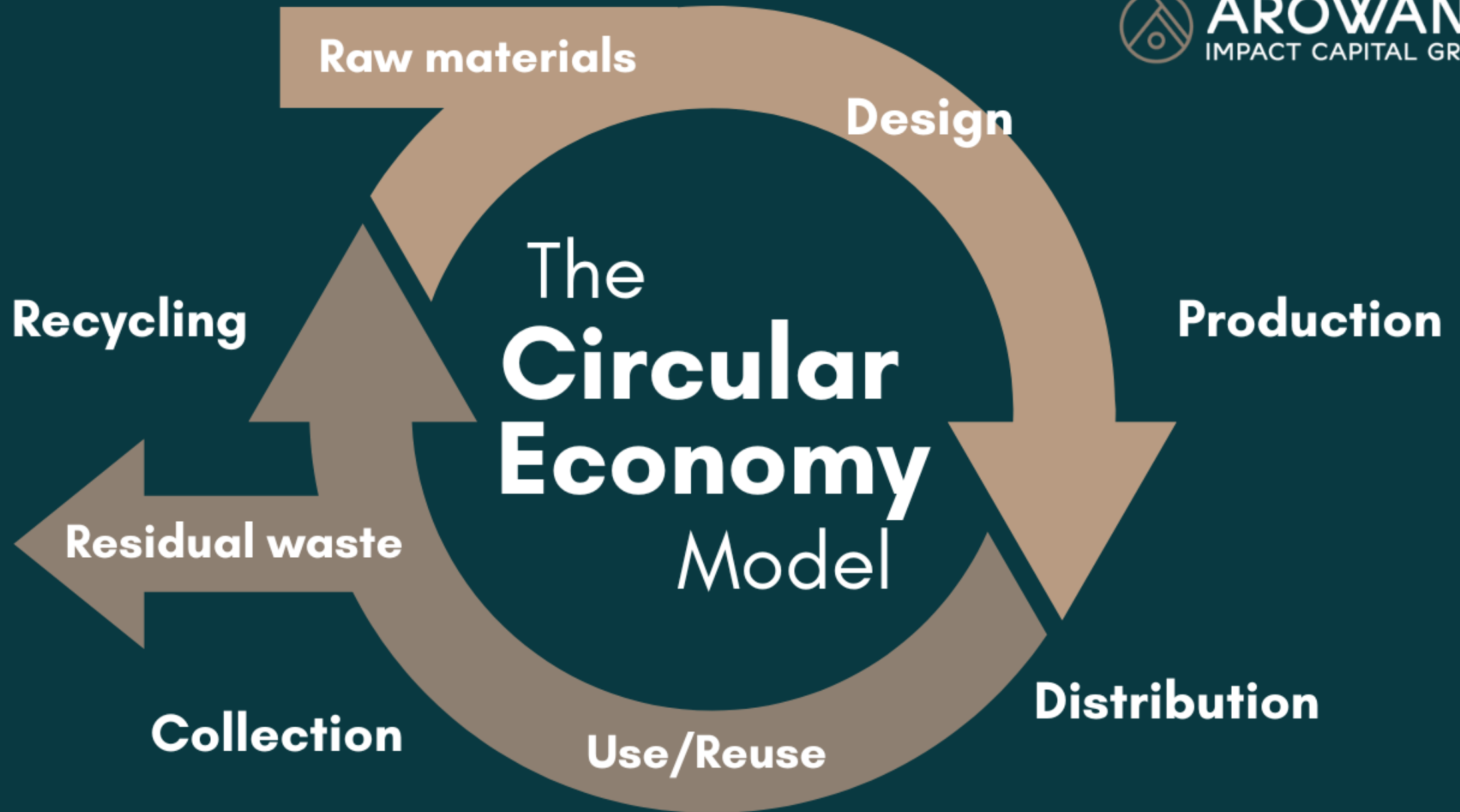


CIRCULAR ECONOMY





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Why Circular Economy Matters



Around **90 billion tons** of natural resources are extracted every year to support the global economy



Based on current trends, that number is expected to **more than double by 2050**



Currently, **only 9% of resources** find their way back into products after their first use



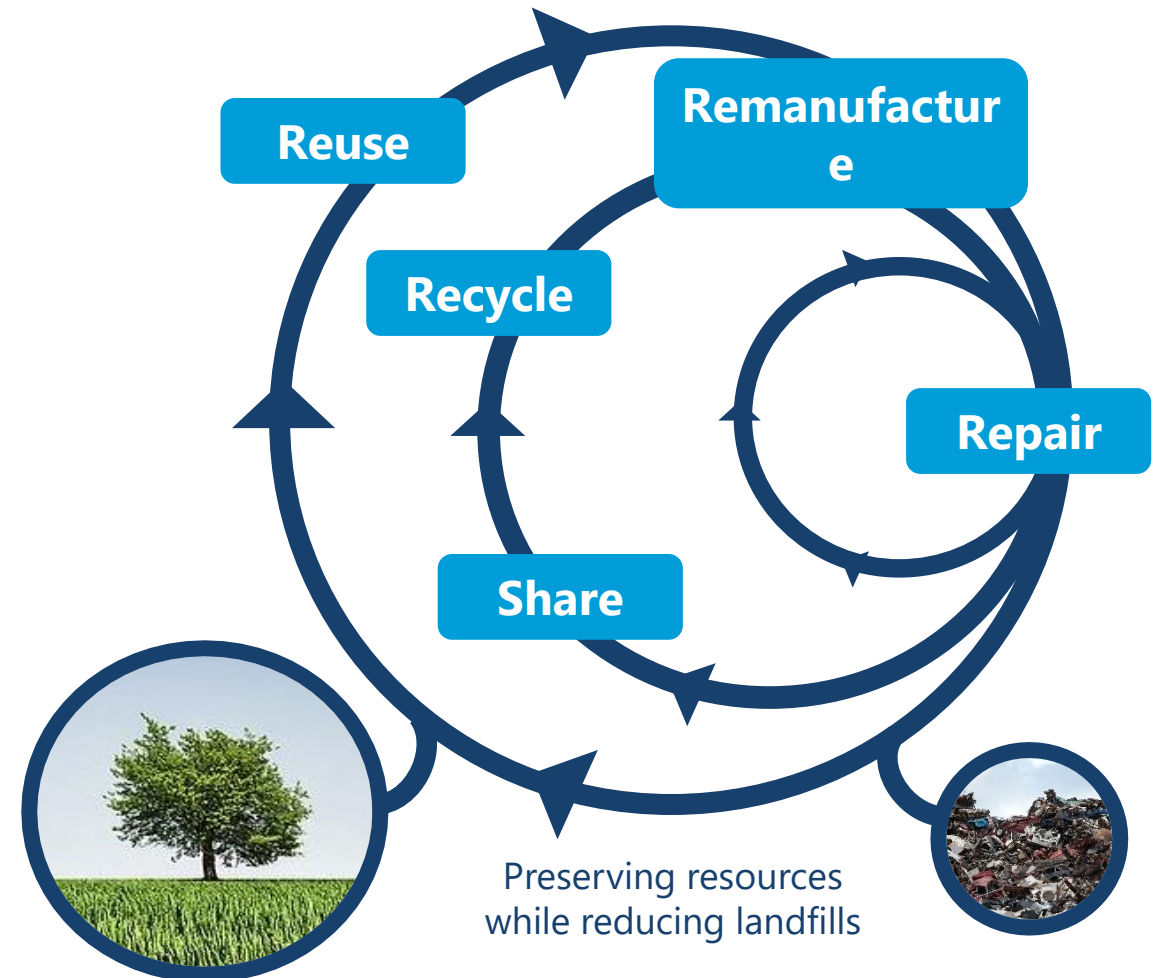
Technology is insufficient to resolve reliance on

From Linear to Circular

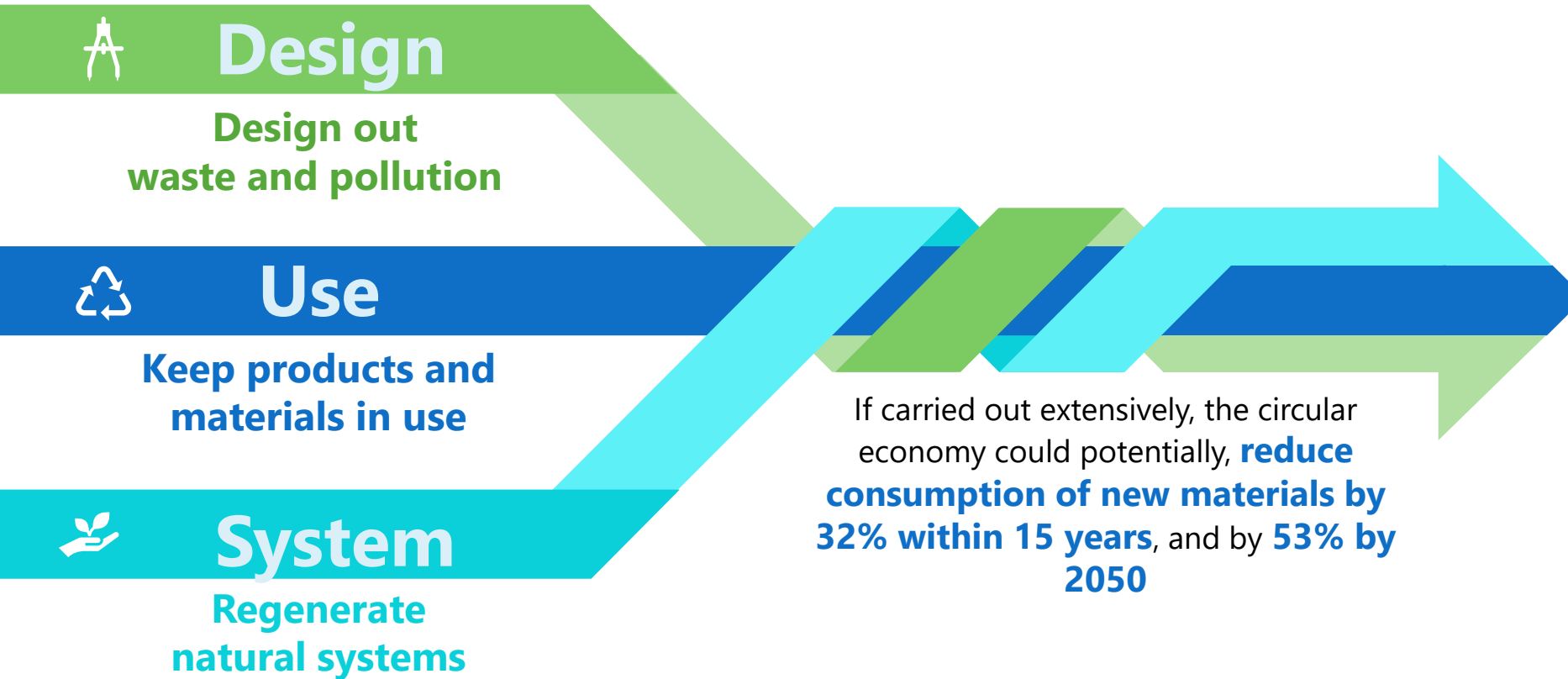
Linear Economy



Circular Economy



Circular Economy Principles



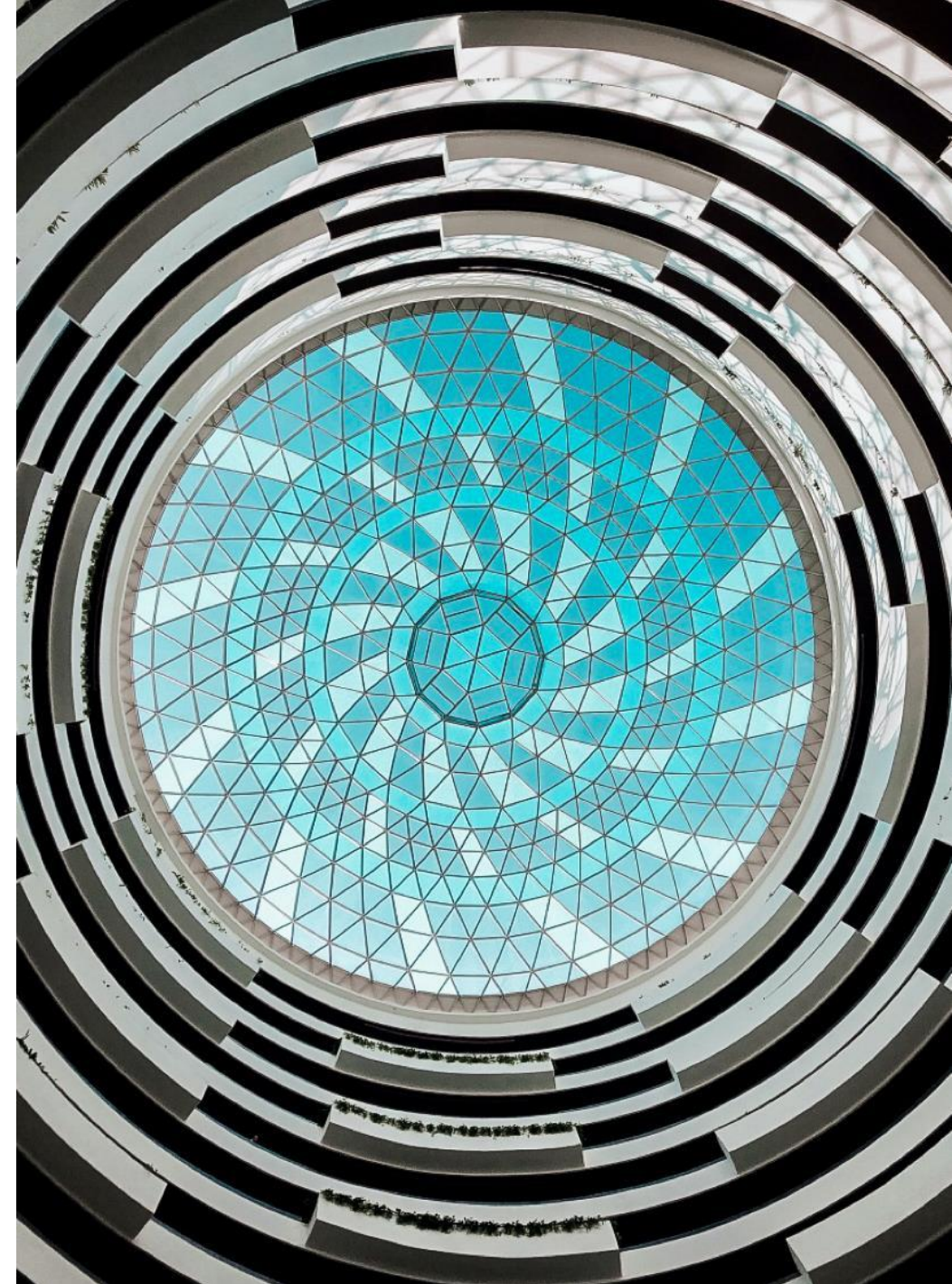
Transition towards a circular economy is estimated to represent a

\$4.5 trillion

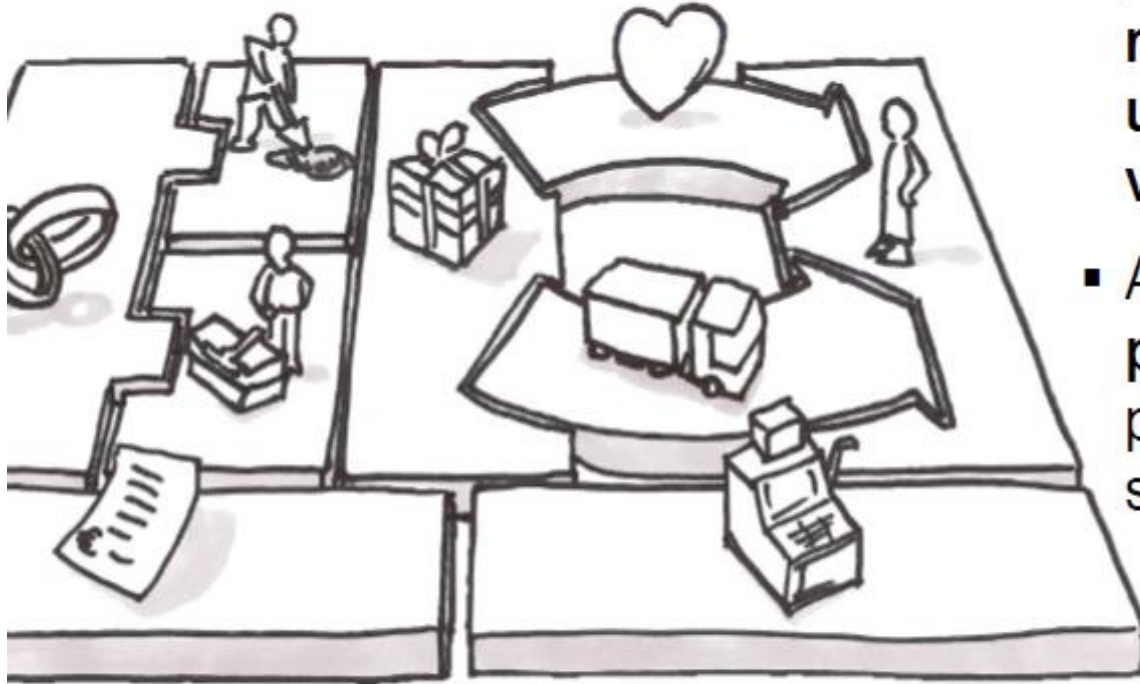
global growth opportunity by 2030, while helping to restore our natural systems

The Circular Economy

- The Circular Economy is a disruptive innovative economic model that relates to government policy, businesses and consumers, which is restorative or regenerative by design, structure, and objective: products, components, and materials should continuously add, recreate, and preserve value at all times.
- It is disruptive because it changes the incumbent model and forces a rethinking of the many various aspects of production and consumption across the entire production and consumption chain.
- This is to use as few resources as possible, for as long as possible, reuse as much of the components as possible, extract as much value from those resources in the most effective way possible, and then recover and regenerate as much of those materials and products at the end of their useful life when and if possible.
- There is, within the concept, an implicit decoupling of resources from the merely productive cycle, which also strongly supports the advancement of the Sustainable Development Goals, set by the United Nations for 2030.



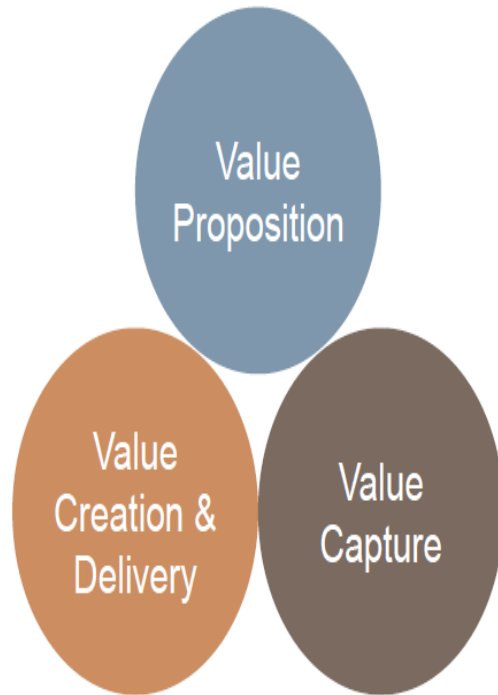
The business model concept



- A business model describes the **rationale of how an organisational unit creates, delivers, and captures value**
- At the core of the business is the **value proposition**, describing which customer problems are solved or customer needs satisfied

Osterwalder and Pigneur (2010)

A three-element framework



Defining a business model involves clearly articulating how your business creates, delivers, and captures value. A well-defined business model provides a blueprint for how you'll operate, generate revenue, and ensure sustainability

Richardson, 2009

Successful Business Models deals with two issues:

- 1 Adding value to the end user
- 2 What problem are you solving?

Determine the specific issue your product or service addresses

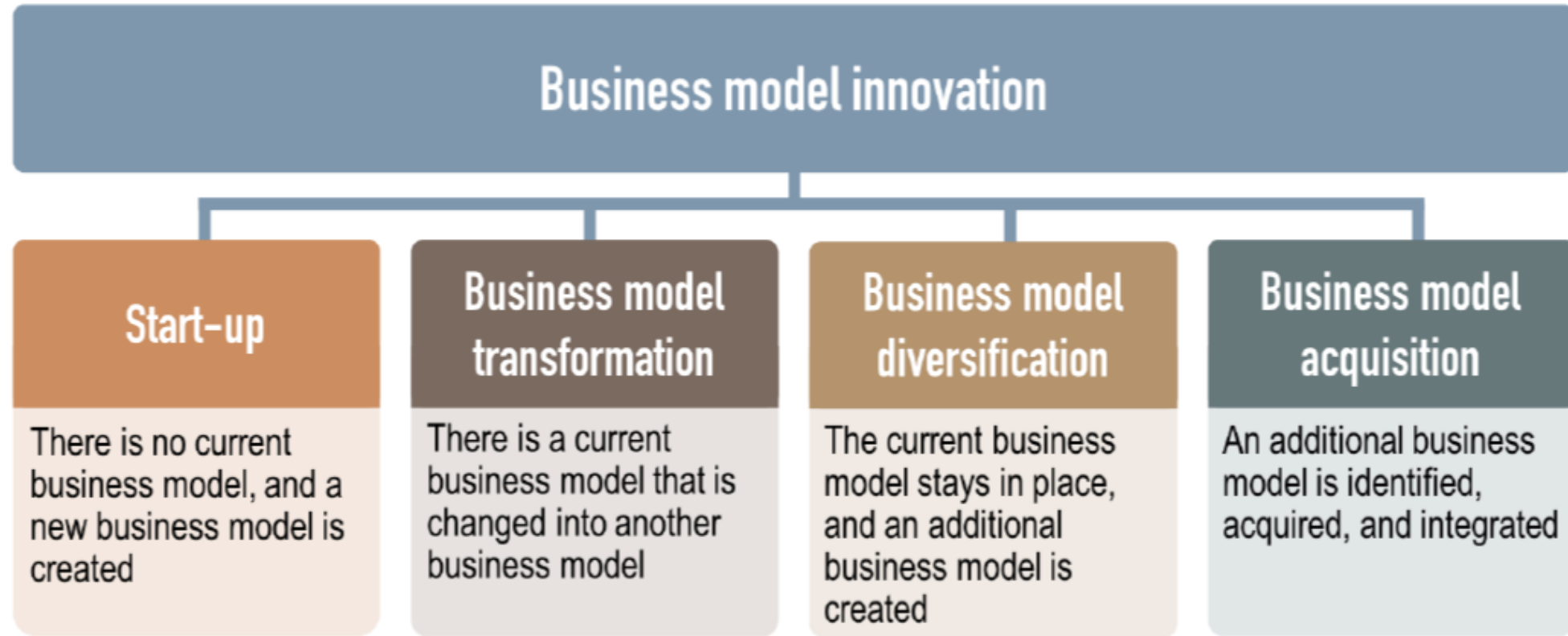
Who is your target market?

Understand the specific group of people who will benefit from your solution.

What makes your product or service different?

Define the unique elements of your offering that make it better or different from competitors.

Business model innovation



Geissdoerfer et al., 2018a

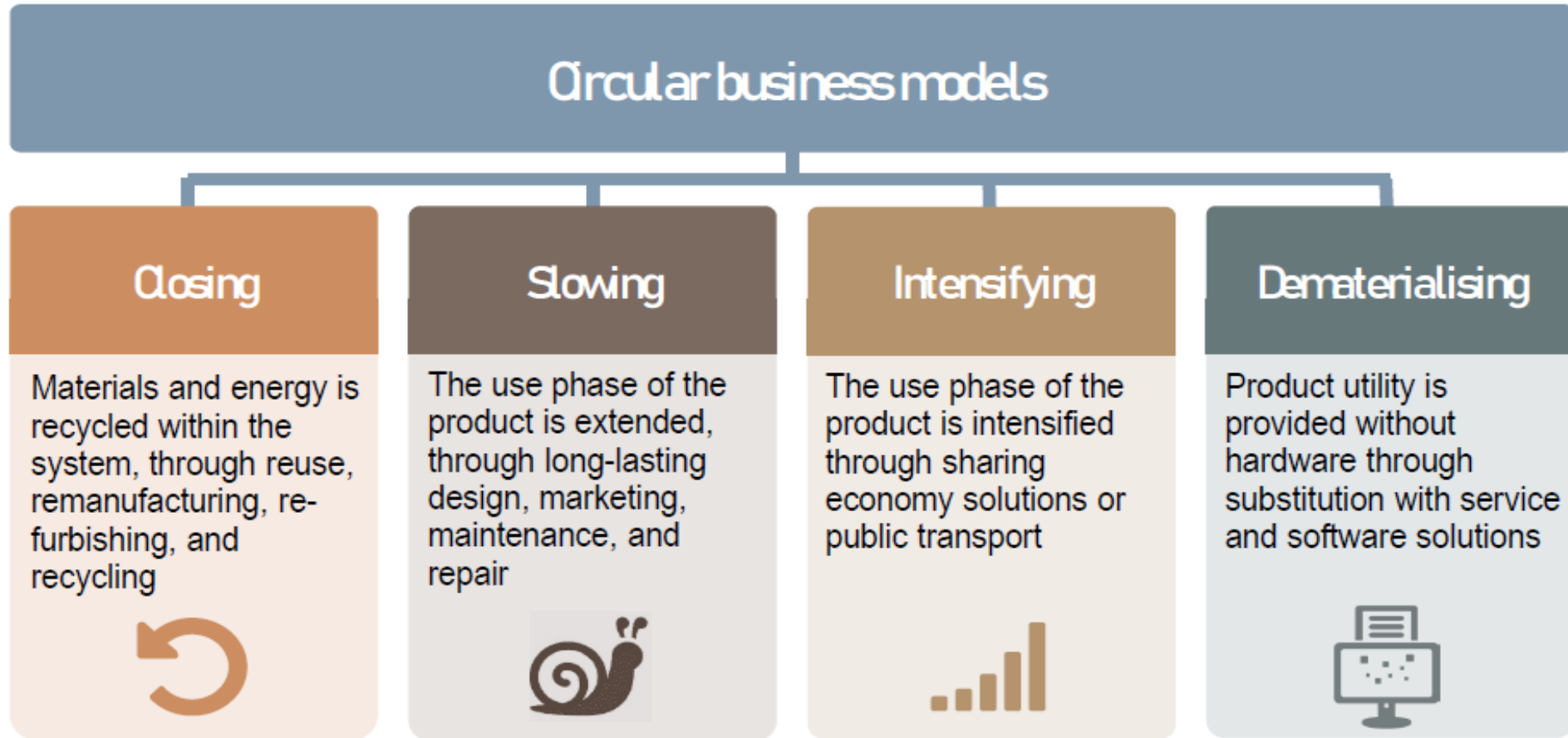
- ➔ Business model innovation capabilities might be the **most important source of sustainable competitive advantage** today

Mitchell and Coles, 2003

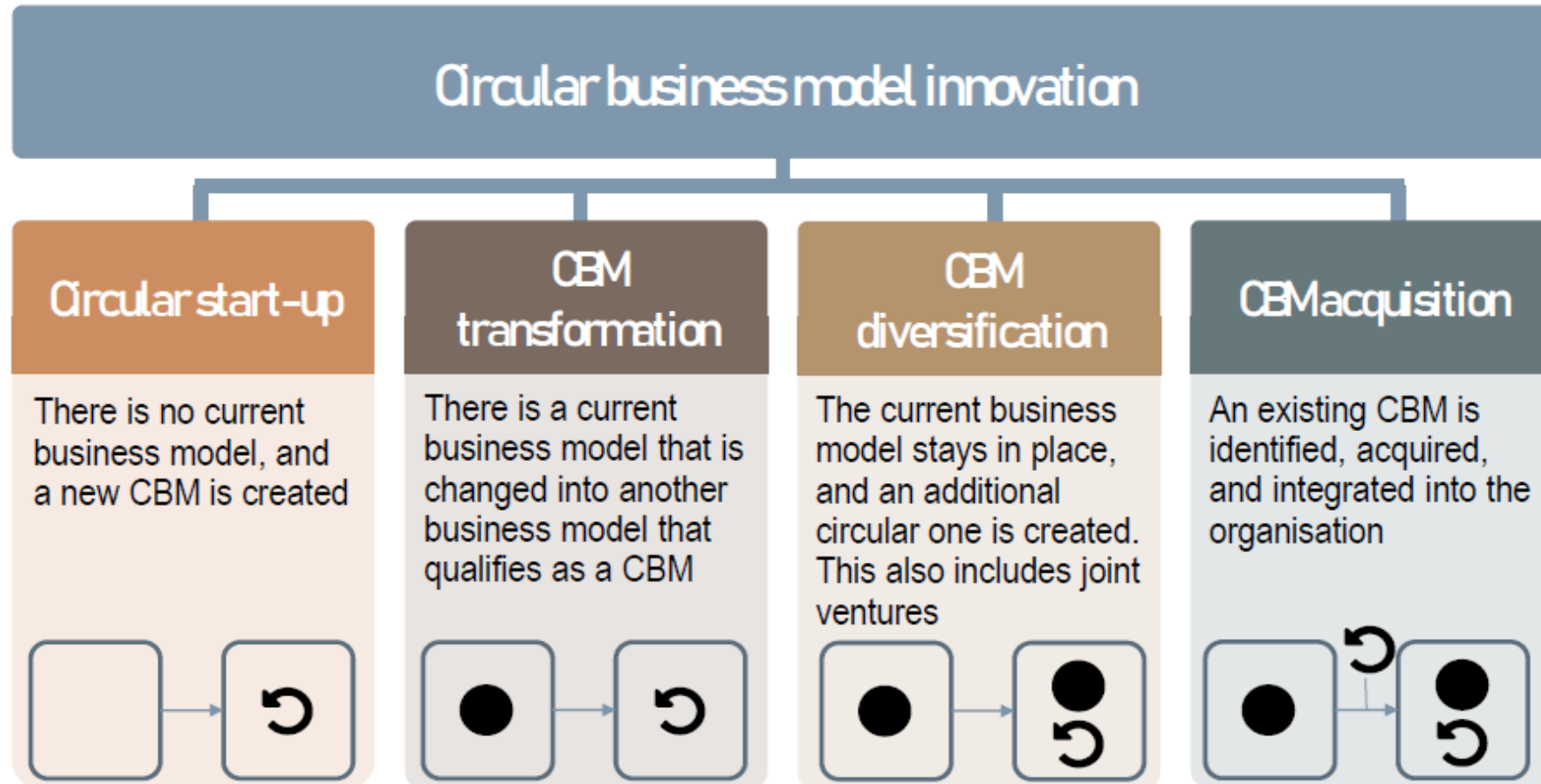
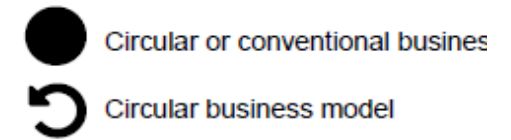
Circular (Economy) business model (CBM) - definition

CBM can be defined as business models that are **closing, extending, intensifying, and/or dematerialising material and energy loops**, to reduce the resource inputs into and the waste and emission leakage out of the organisational system

4 types of CBM



4 types of circular business model innovation

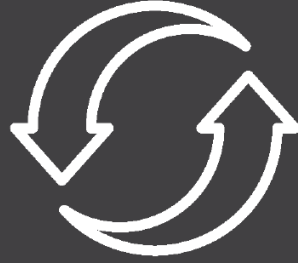




EXTEND
USE LONGER

Extend the usable life of products and materials

Examples: more durable materials, product repair, refurbishment



RECLAIM
USE AGAIN

Recover and reuse materials and energy

Examples: component remanufacturing, recycling, waste-to-energy



MAXIMIZE
USE DIFFERENTLY

Make idle products or capacities available for use

Examples: products-as-a-service, sharing, renting, virtualizing



MINIMIZE
USE LESS

Optimize resource efficiency and minimize waste in operations and product life cycles

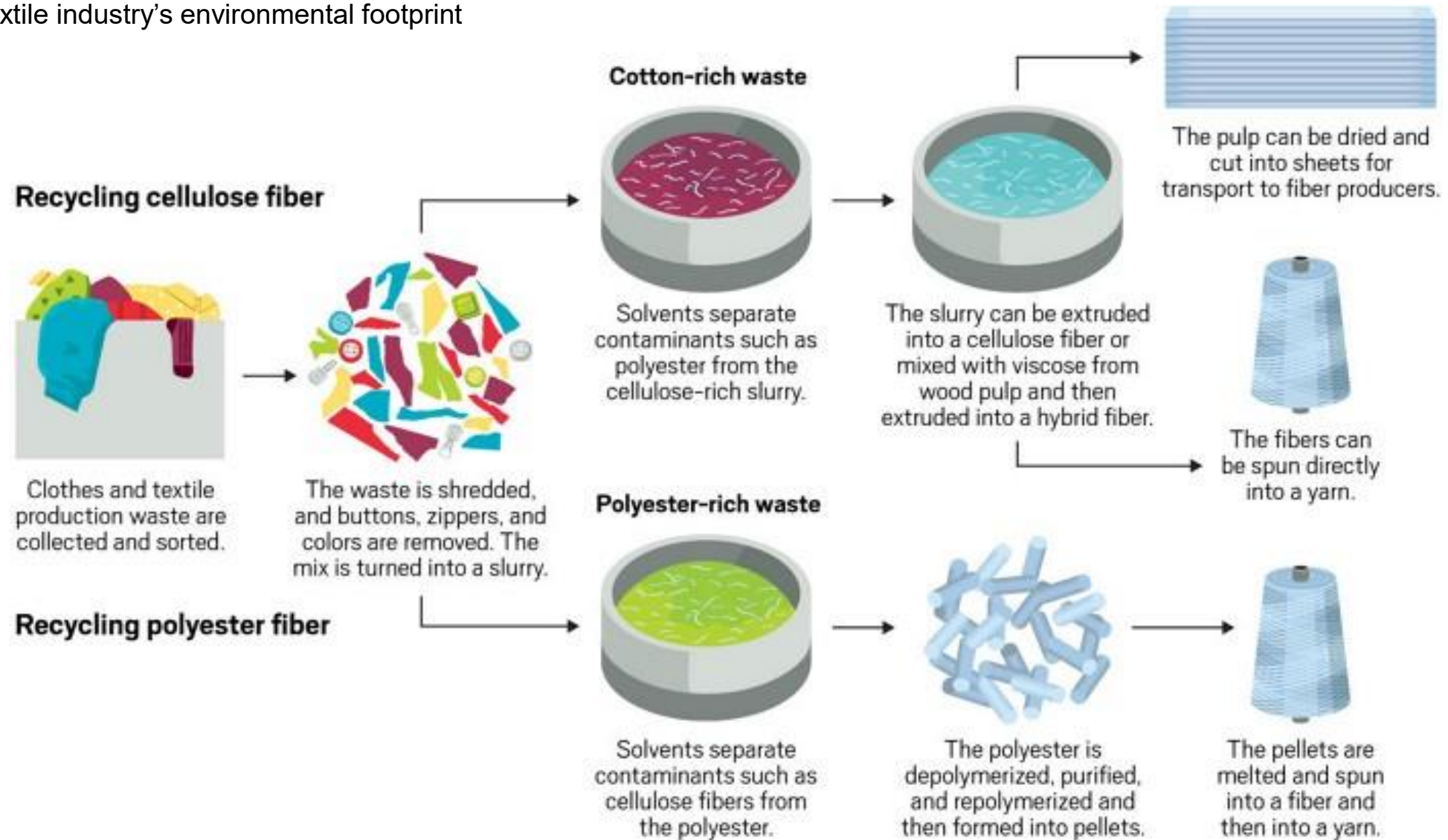
Examples: energy efficiency, zero-waste, predictive maintenance

Key Principles of Circular Economy in Textiles

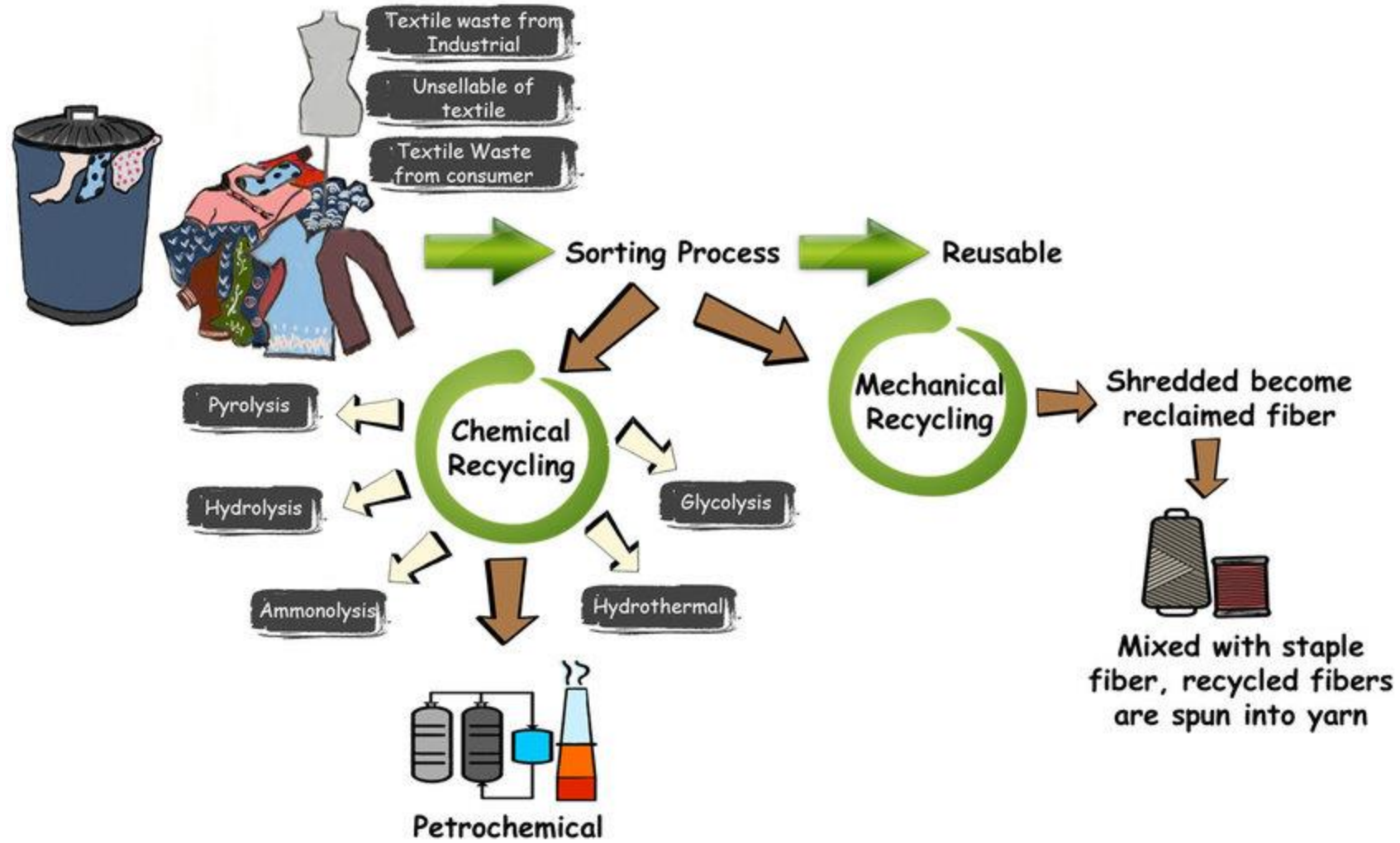
- **Design for Longevity:**
 - Use durable materials and production techniques to extend the life of garments.
- **Use of Renewable and Recycled Materials:**
 - Replace virgin materials with renewable or recycled fibres, such as recycled polyester or organic cotton.
- **Business Model Innovations:**
 - Repair, reuse, and remanufacture rather than disposing of old garments.
 - Leasing models or take-back schemes where consumers return used garments for recycling or upcycling.
- **Closed-loop Production Systems:**
 - Waste materials are reintegrated into the production process rather than being discarded.

Transforming textiles

How chemical recycling technologies could play a key role in slashing the textile industry's environmental footprint



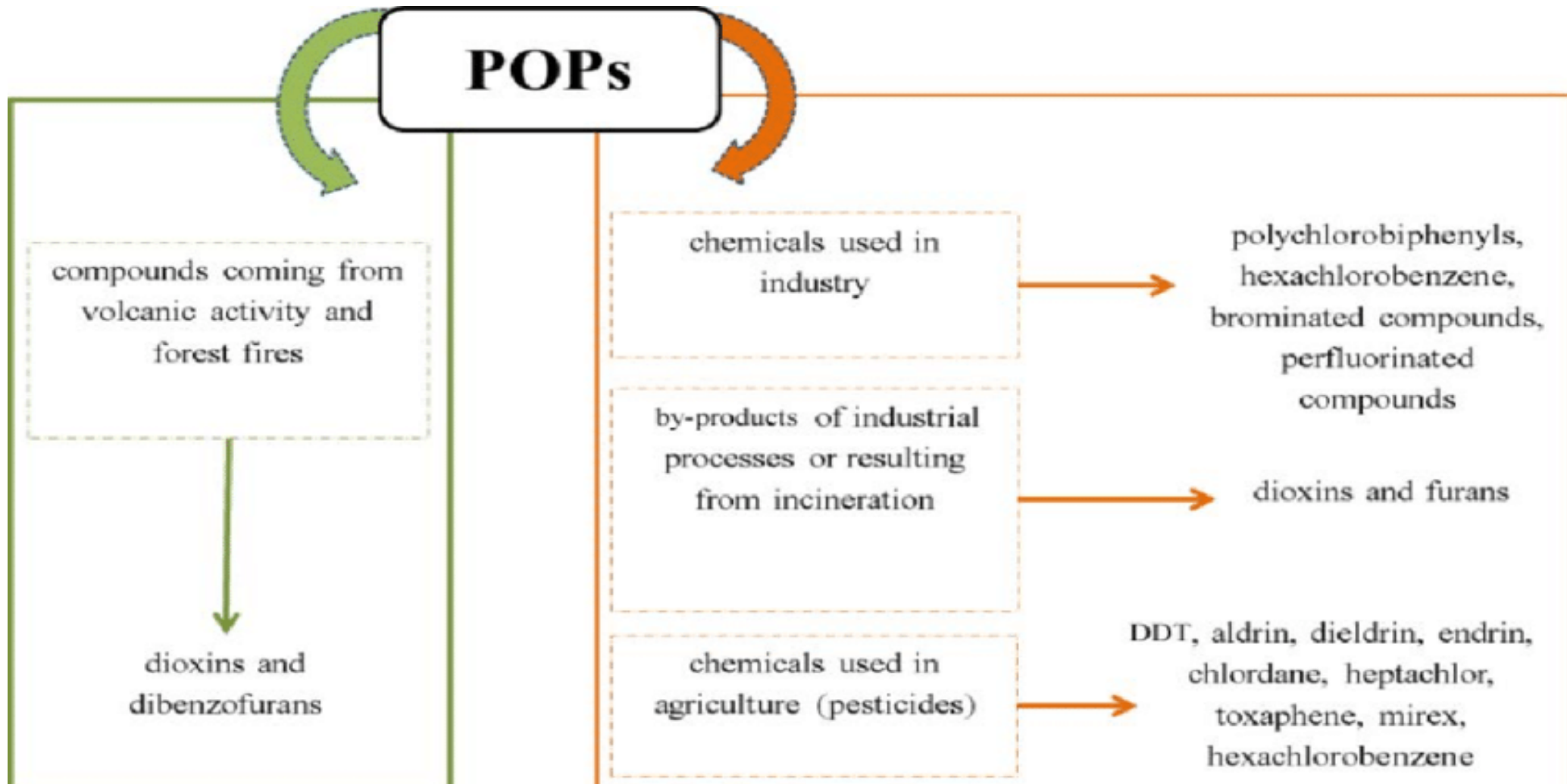
<https://cen.acs.org/environment/green-chemistry/Transforming-textiles/100/i11>



https://www.researchgate.net/figure/Mechanisms-of-possible-textile-waste-recycling-routes_fig3_355982160

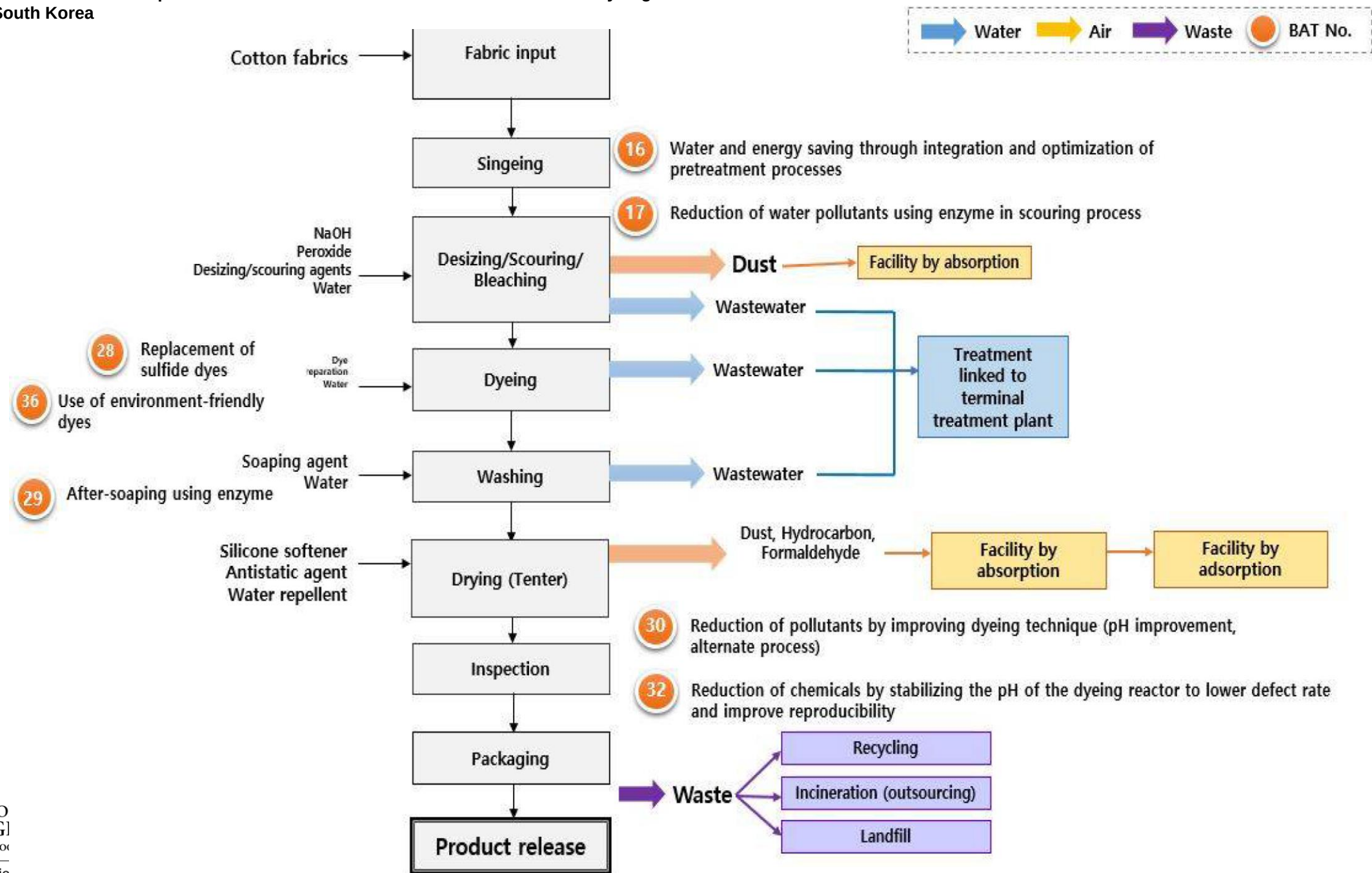
POP-Free Manufacturing in the Textile Industry

- **POP (Persistent Organic Pollutants)** are toxic chemicals that persist in the environment and accumulate in living organisms.
- In textile production, certain dyes and chemicals may contain POPs, leading to pollution.
- **The Shift to POP-Free Manufacturing:**
 - Focuses on eliminating harmful chemicals from production processes, particularly those in dyes, finishes, and textile treatments.
 - The goal is to protect both environmental and human health by using safer alternatives.
- **Benefits:**
 - Reduction of environmental pollution, particularly water and soil contamination.
 - Improved health and safety standards for workers and consumers.



Implementing Best Available Techniques (BAT) in Textile Manufacturing

- BAT refers to the most effective and advanced methods for minimizing environmental impacts while maintaining economic feasibility.
- In textile manufacturing, BAT includes cleaner technologies and efficient use of resources.
- **Examples of BAT in Textile Manufacturing:**
 - **Waterless dyeing technologies:** Such as air dyeing and supercritical CO2 dyeing that eliminate water usage.
 - **Low-impact dyes:** Using dyes that require less energy and water and are free from harmful chemicals.
 - **Energy-efficient machinery:** Reducing energy consumption in production processes.
 - **Wastewater treatment systems:** Advanced filtration and closed-loop water systems that reduce water pollution.



Best Environmental Practices (BEP) in Textile Manufacturing

- **What are BEPs?**
 - BEP are practical approaches and practices that businesses can adopt to minimize environmental impact.
 - In textile and garment production, BEPs focus on sustainability and reducing the carbon footprint.
- **Examples of BEPs:**
 - **Eco-friendly fabric sourcing:** Use of organic, fair-trade, or recycled materials to reduce environmental impact.
 - **Sustainable garment care:** Educating consumers on how to extend garment life through proper washing, drying, and recycling.
 - **Design for Disassembly:** Designing products that are easy to disassemble and recycle.
 - **Efficient resource use:** Reducing water, energy, and raw material usage in the production process.

HOW DO COUNTRIES DETERMINE BEST AVAILABLE TECHNIQUES (BAT) AND PERMIT CONDITIONS FOR PREVENTING AND CONTROLLING INDUSTRIAL POLLUTION?

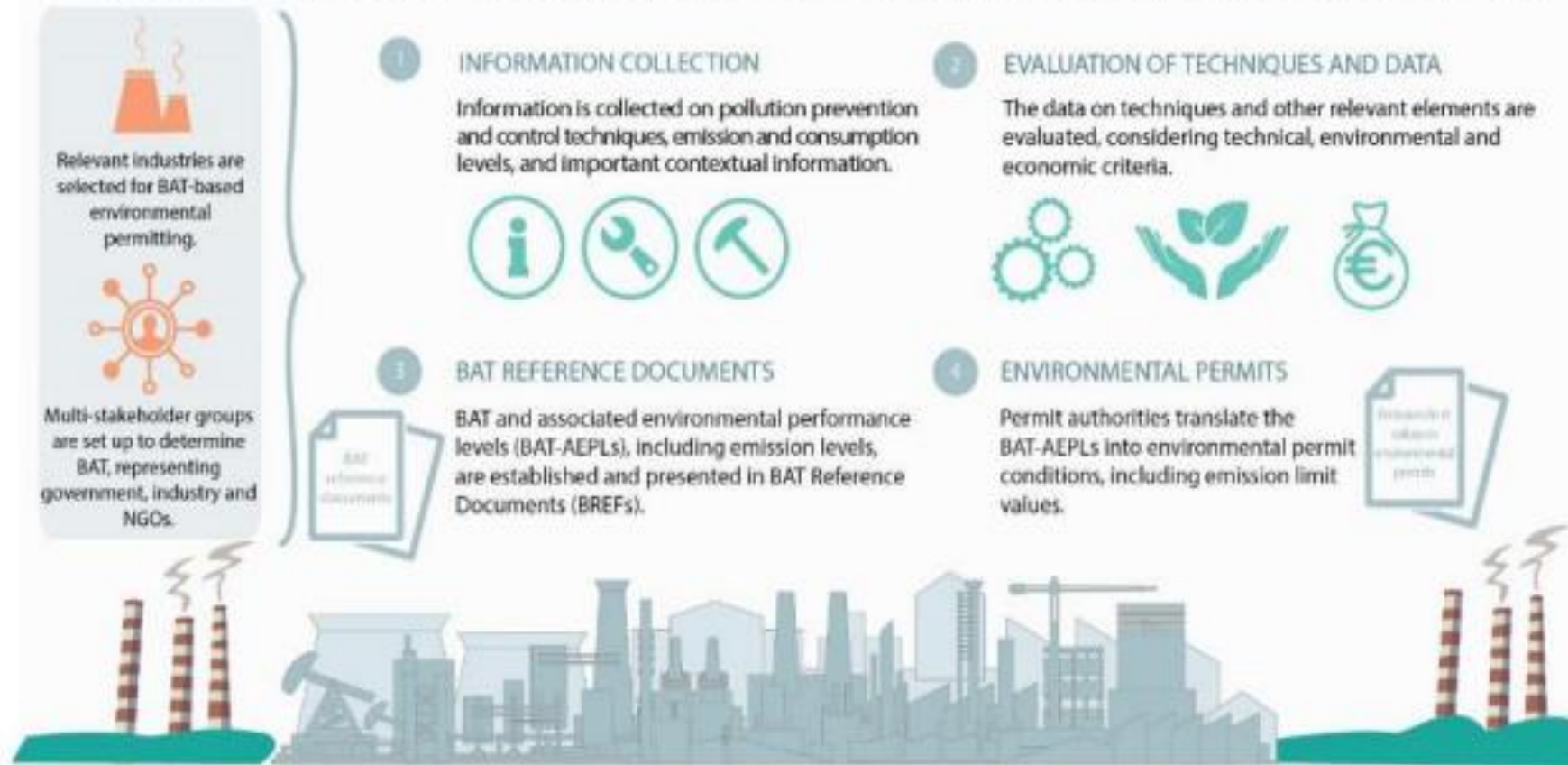


Figure 2.1b The steps to establishing BAT, BAT-AE(P)Ls and BAT-based permit conditions. Source: OECD (2020)

Benefits of Adopting Circular Economy Models in Textiles

- **Environmental Benefits:**

- Significant reduction in waste, water usage, and carbon emissions.
- Decrease in pollution (air, water, and soil) by eliminating harmful chemicals and POPs.

- **Economic Benefits:**

- Increased resource efficiency and cost savings in the long term.
- New business opportunities through recycling, upcycling, and resale models.

- **Social Benefits:**

- Healthier working conditions by eliminating toxic chemicals.
- Empowering consumers through eco-conscious choices and increasing the demand for sustainable products.

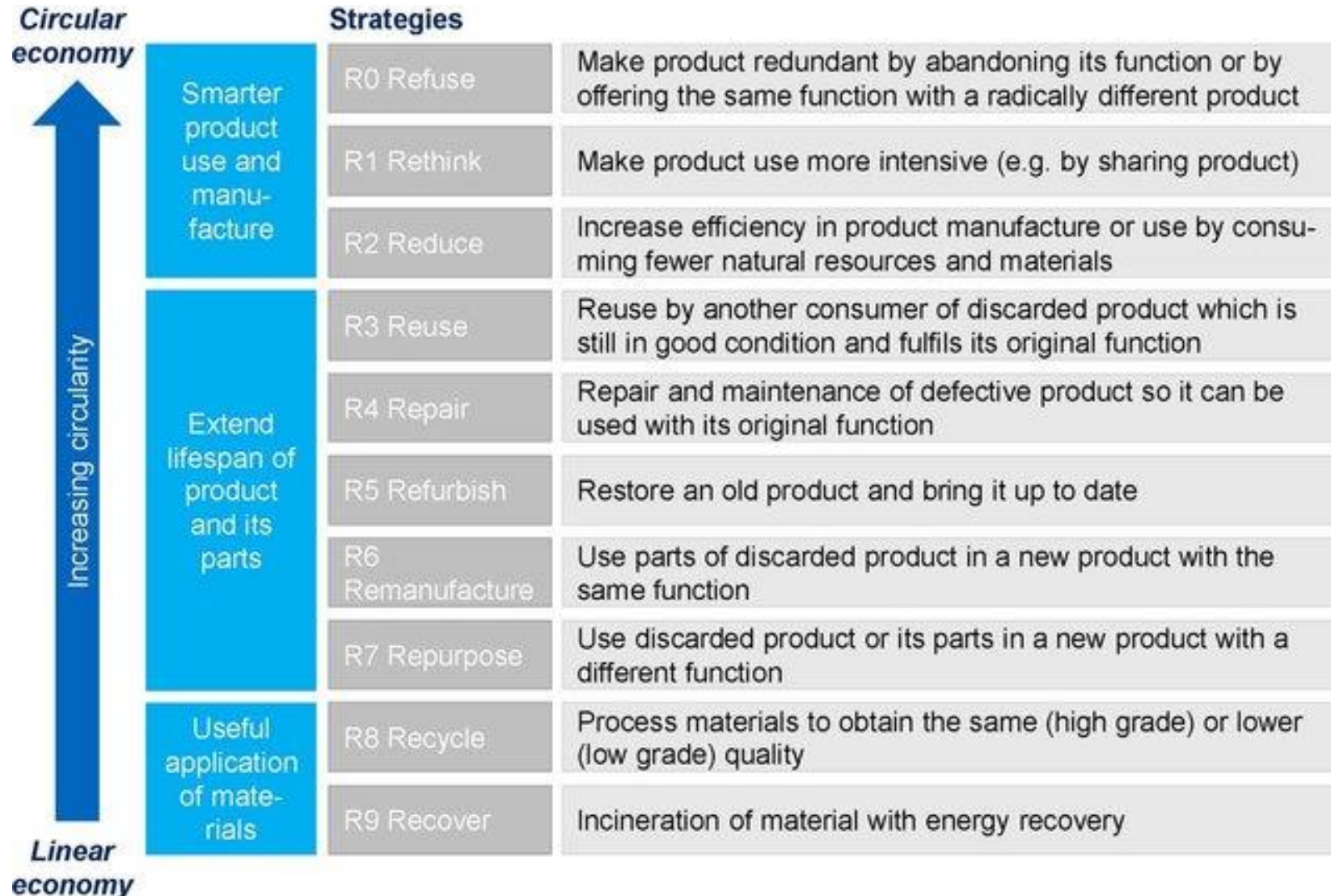
Challenges and Barriers to business models in textile and garment

- **Technological Challenges:**
 - High costs of adopting advanced technologies like waterless dyeing or recycling systems.
 - Lack of infrastructure for efficient garment collection and recycling.
- **Regulatory and Market Barriers:**
 - Limited regulations requiring the elimination of POPs in the textile industry.
 - Resistance from traditional industry players to shift away from conventional practices.
- **Consumer Awareness:**
 - Lack of consumer awareness about the importance of POP-free manufacturing and circular economy benefits.

One to SOLUTION TO BARRIERS – PUBLIC-PRIVATE-PARTNERSHIP (PPP)

Green Finance, Green Logistic, Green Value Chain

9R's of Circularity



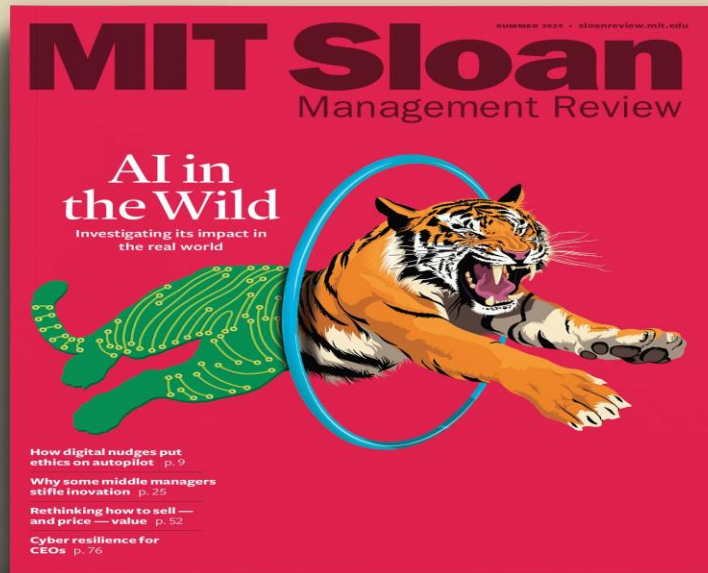
Lifecycle View:

Many benefits come from smarter use (or don't use!)

e.g. Use office space more efficiently

Effective circularity needs to **be planned and designed** up front

e.g. Design buildings for reuse, reconfiguration, disassembly



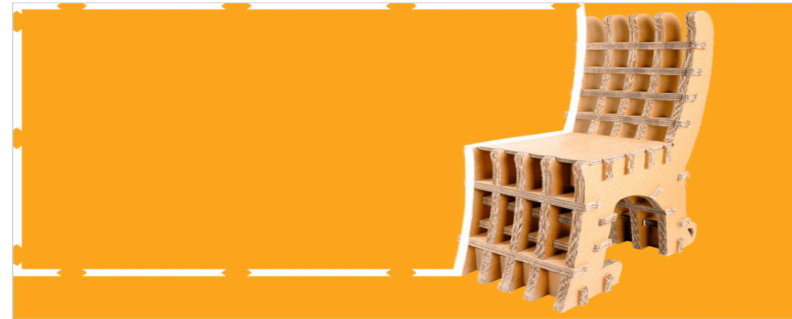
Harvard
Business
Review

SUSTAINABILITY

How Businesses Can Support a Circular Economy

by Terence Tse, Mark Esposito, and Khaled Soufani

FEBRUARY 01, 2016



Since the industrial revolution, we have been able to get away with using resources to raise our standard of living. But as these resources become more expensive, we need to find new ways to create a more sustainable economy.

<https://hbr.org/2016/02/how-businesses-can-support-a-circular-economy>



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IMPROVING THE STATE
OF THE WORLD

4 ways green chemistry is helping
make the world a better place

Stanford SOCIAL
INNOVATION REVIEW

The Circular Economy Takes on Food Waste
Eliminating food waste is economically plausible
and can unleash new opportunities for
businesses.

Companies Are Working with Consumers to Reduce Waste

6/7/16, 10:37

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SUSTAINABILITY

Companies Are Working with Consumers to Reduce Waste

by Mark Esposito, Terence Tse, and Khaled Soufani

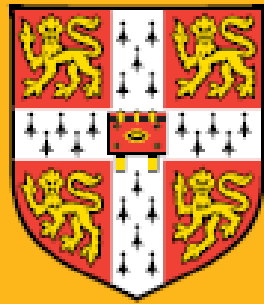
JUNE 07, 2016



As consumers, we are very wasteful. Annually, the world generates 1.3 billion tons of solid waste. This is expected to go up to 2.2 billion by 2025. The OECD countries are responsible for 44% of waste, and in the U.S. alone, the average person throws away their body weight in waste each year.

<https://hbr.org/2016/06/companies-are-working-with-consumers-to-reduce-waste>

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