Role of manufacturing in sustainability and its impacts on everyday life

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Thessaloniki, 07 of March 2018

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Applied research into clean technologies

The Eurecat Technological Sustainability Unit is home to 45 specialists in R&D and innovation projects in the fields of **water technologies**, **waste management and treatment, soil contamination, energy efficiency**, **renewable energies**, and also **environmental impact assessment tools**.

Applied research into clean technologies

Serving to increase efficiency and productivity by employing new processes and products that also help to protect the environment and natural resources



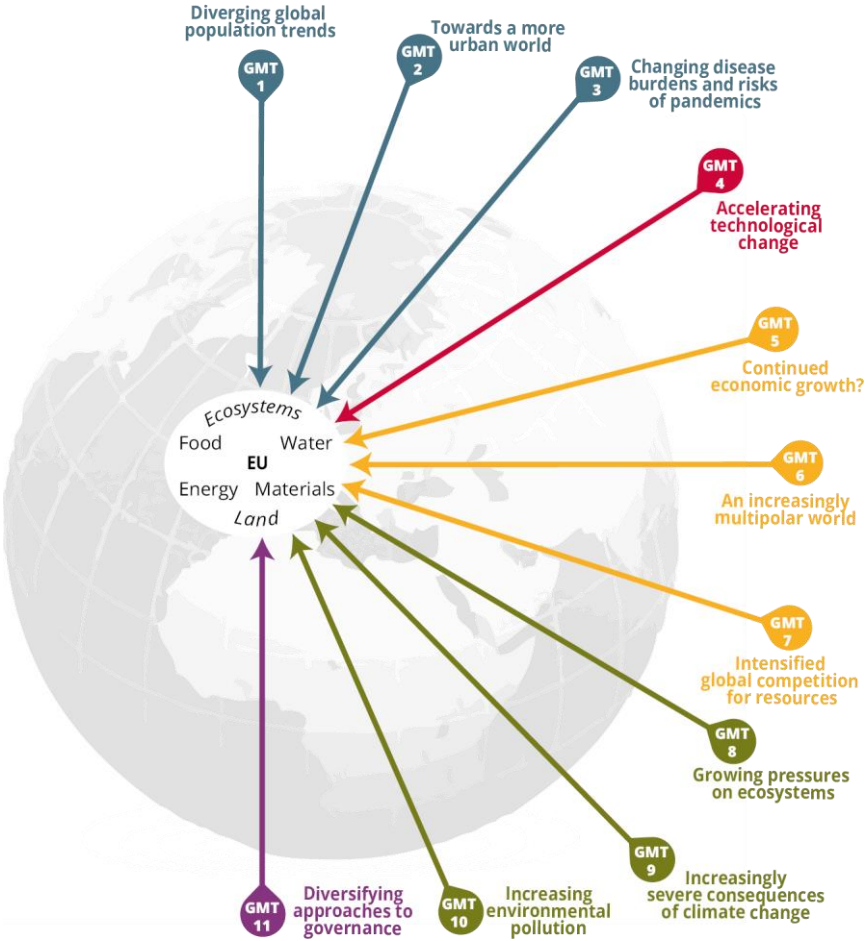






- Introduction of Current Situation
- Circular Economy in Manufacturing
- Circular Economy Implementation to Improve Sustainability

Introduction



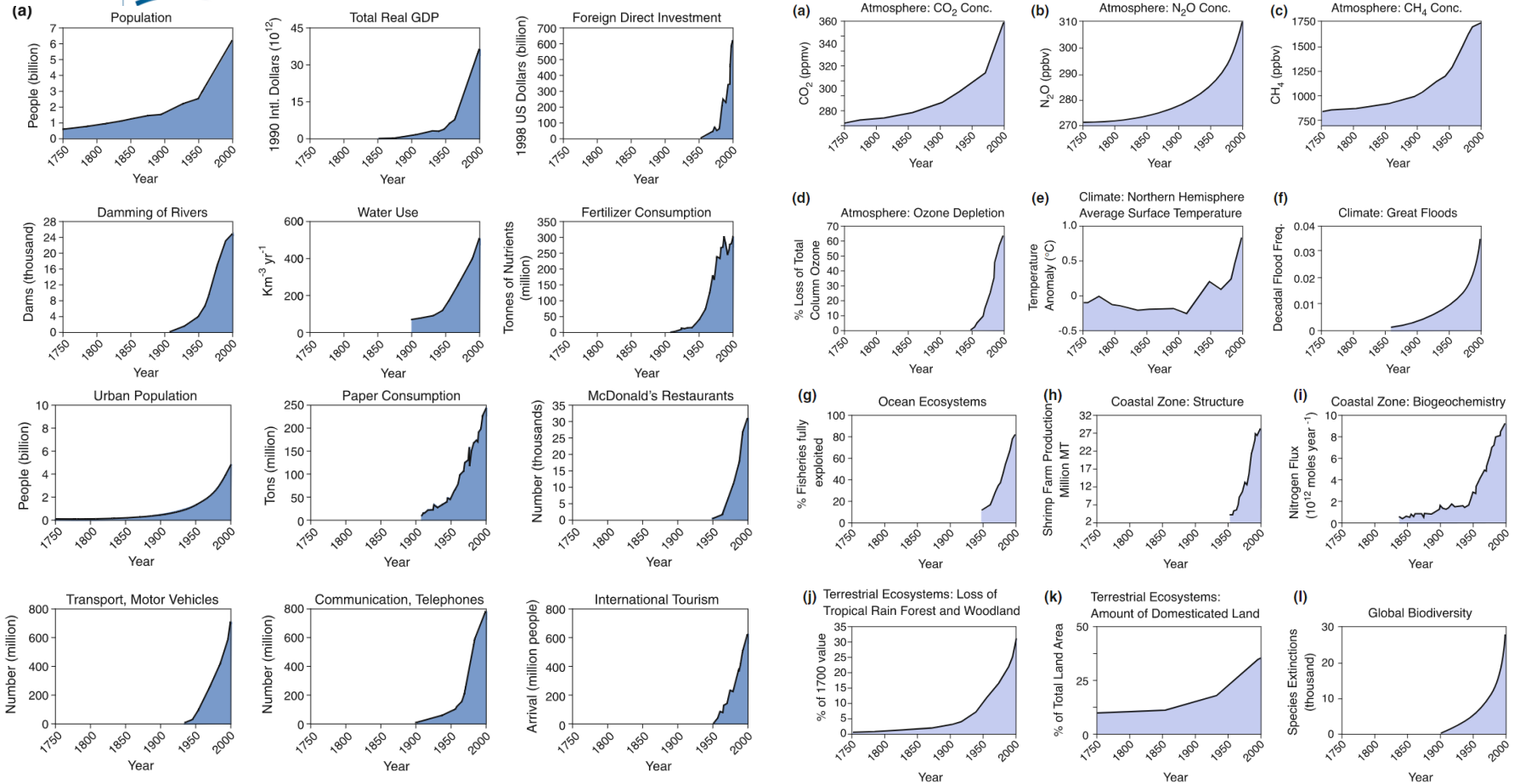
Global Megatrends

Influence at:

- Ecosystems
- Food
- Water
- Energy
- Materials
- Land

European Environment Agency

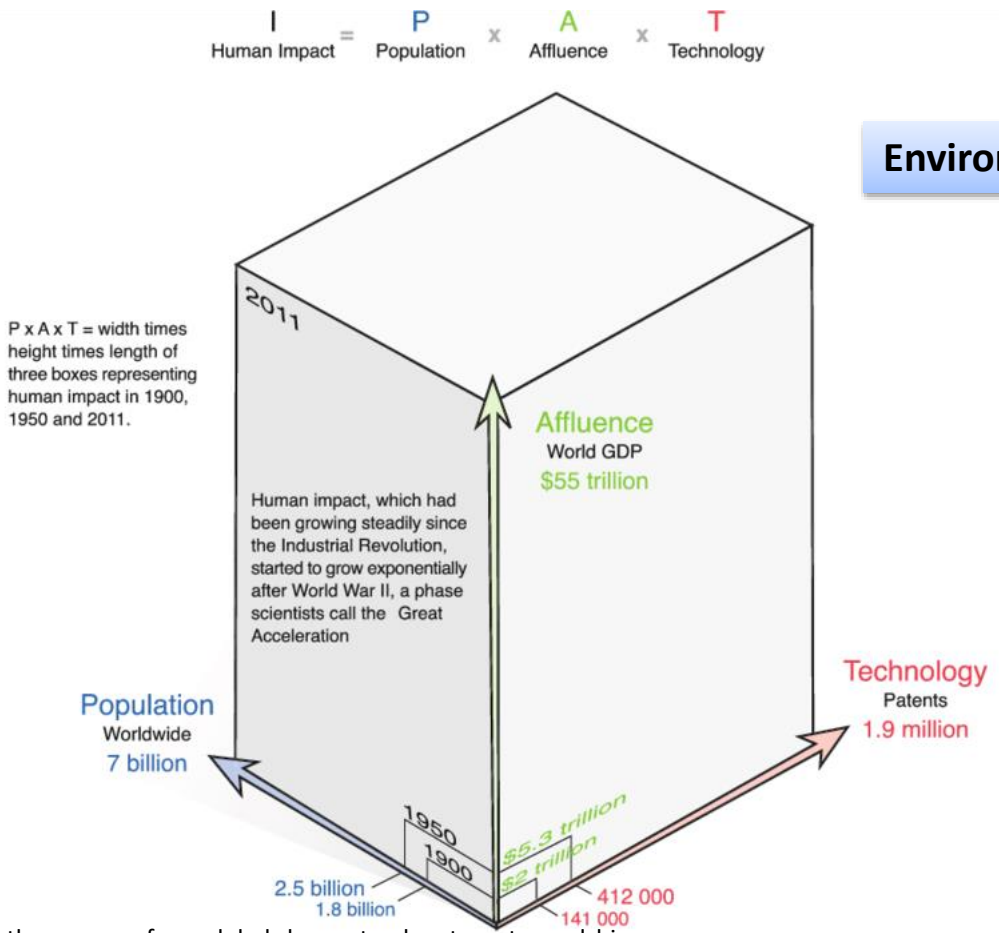
Introduction



Steffen et al. (2011) The Anthropocene: from global change to planetary stewardship

Introduction

Environmental impact



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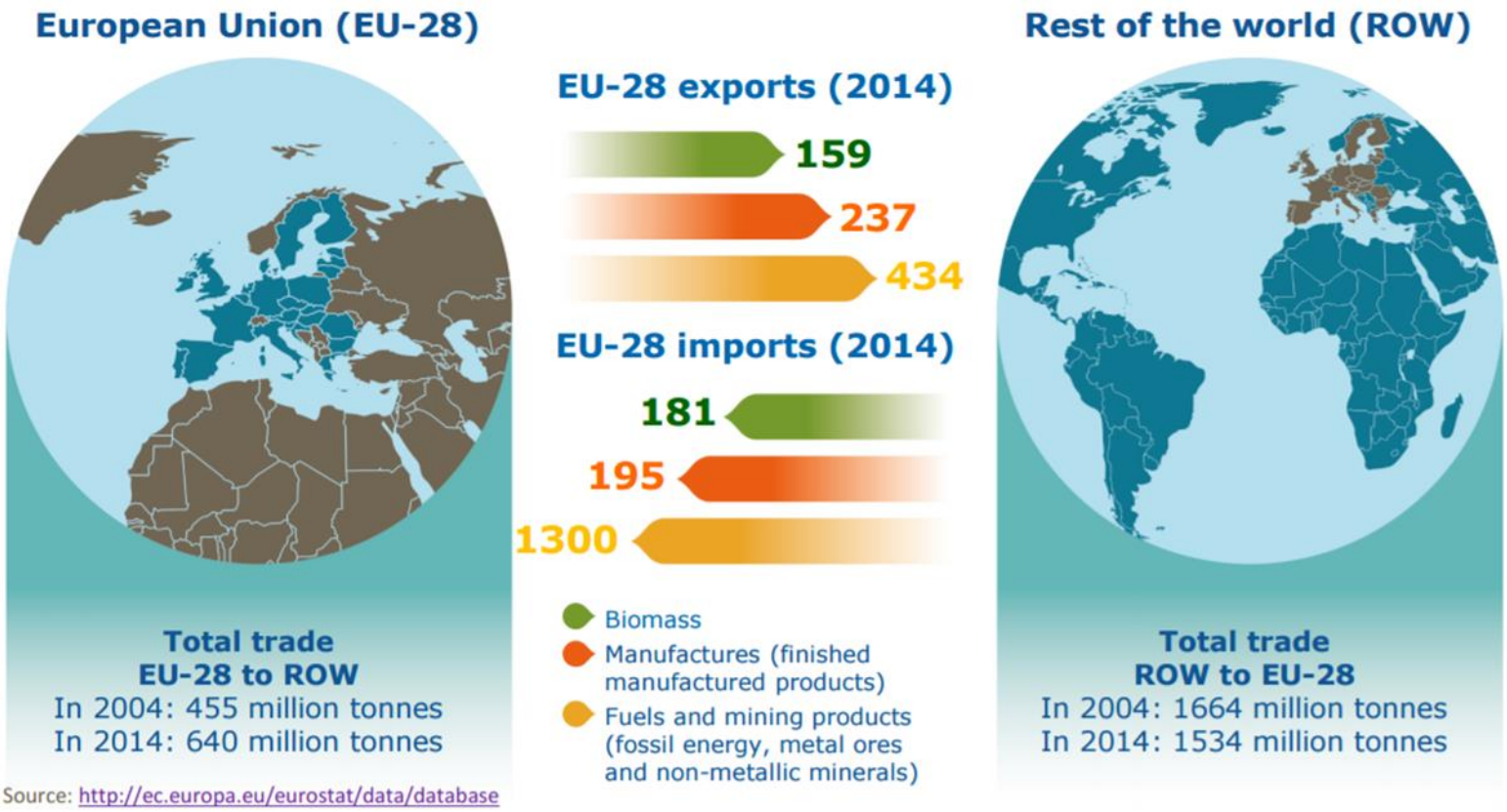
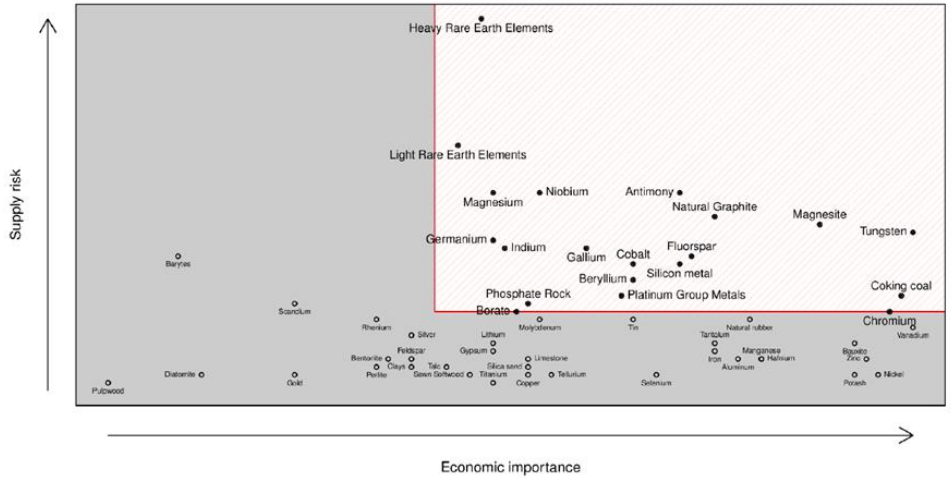


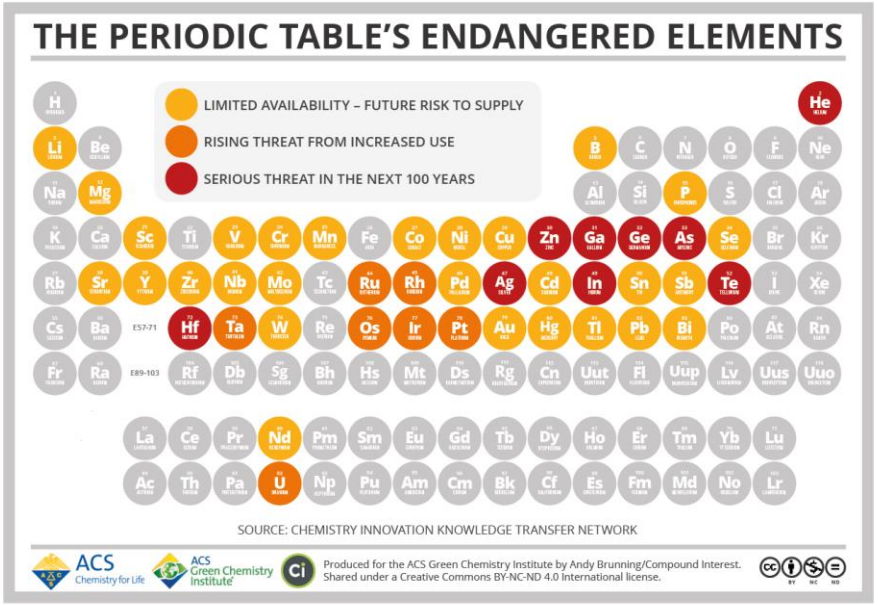
Source: http://ec.europa.eu/eurostat/data/database

Introduction

Antimony	Beryllium	Borates	Chromium	Cobalt	Coking coal	Fluorspar
Gallium	Germanium	Indium	Magnesite	Magnesium	Natural Graphite	Niobium
PGMs	Phosphate Rock	REEs (Heavy)	REEs (Light)	Silicon Metal	Tungsten	

CRM's
Critical Raw Materials

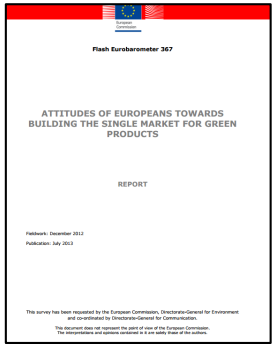




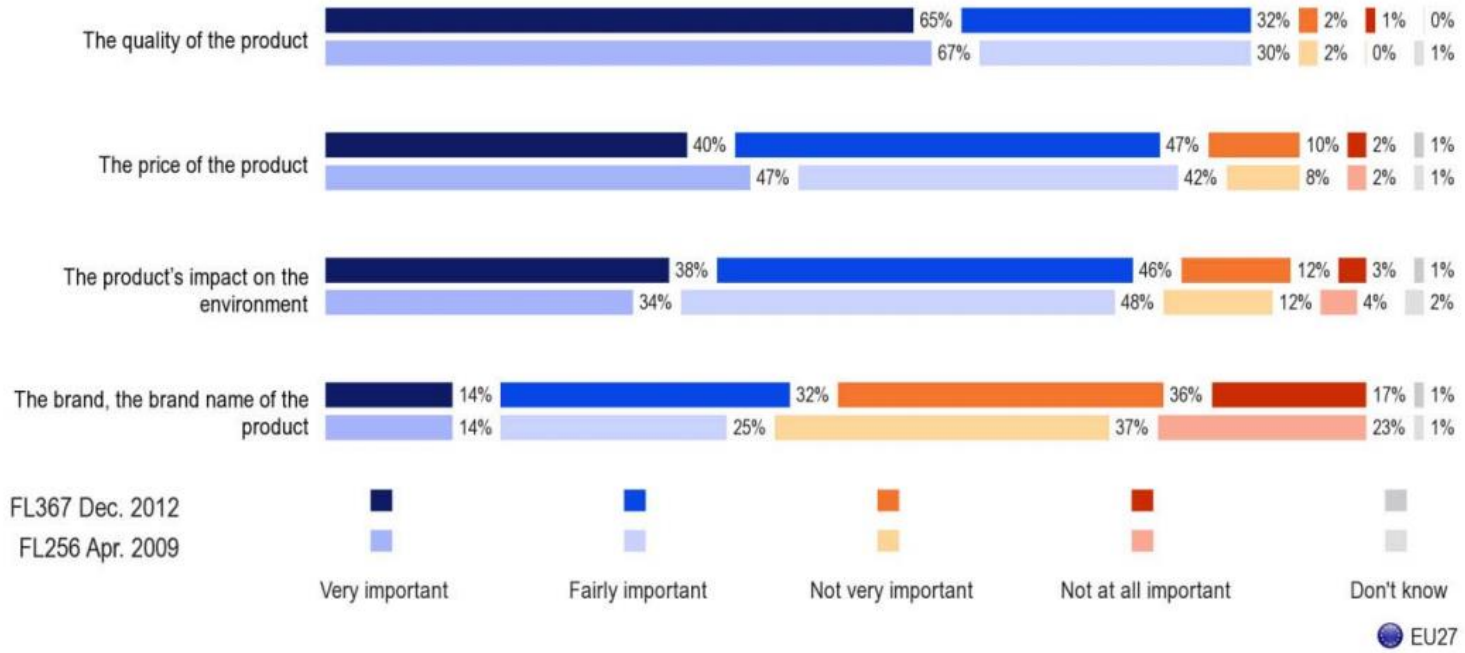
REPORT ON CRITICAL RAW MATERIALS FOR THE EU

Report of the Ad hoc Working Group on defining critical raw materials (2014)

The Role of the Consumer



Q2. Would you say that, when making a decision on what products you buy, the following aspects are important or not?



The Role of the Consumer

European Commission

Flash Eurobarometer 367

ATTITUDES OF EUROPEANS TOWARDS BUILDING THE SINGLE MARKET FOR GREEN PRODUCTS

REPORT

Fieldwork: December 2012

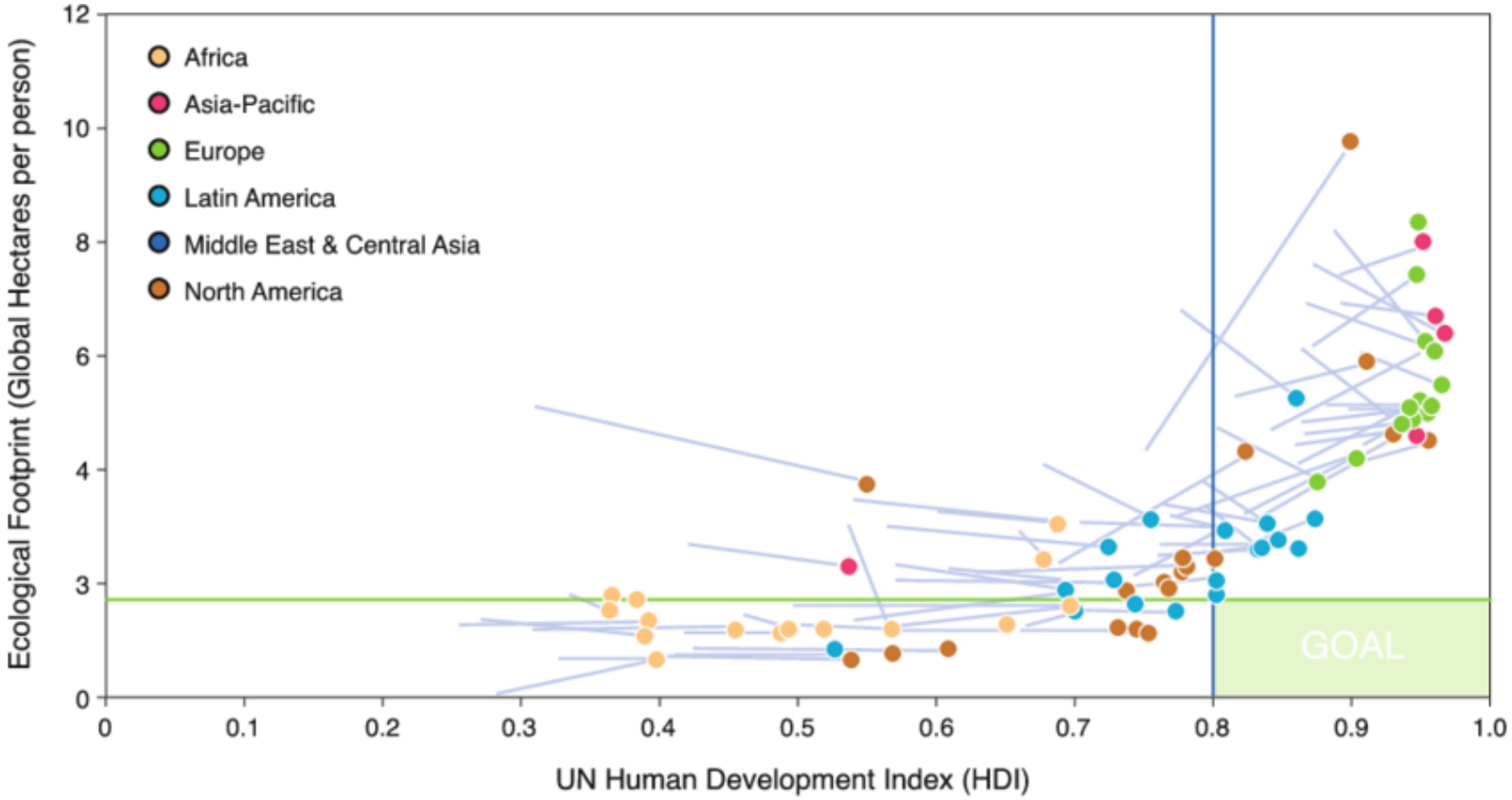
Publication: July 2013

This survey has been requested by the European Commission, Directorate-General for Environment and co-ordinated by Directorate-General for Communication.

This document does not represent the point of view of the European Commission. The interpretations and opinions contained in it are solely those of the authors.

Q6. How much more, if anything, would you be willing to pay for products if you were confident that they were more environmentally friendly?

Introduction



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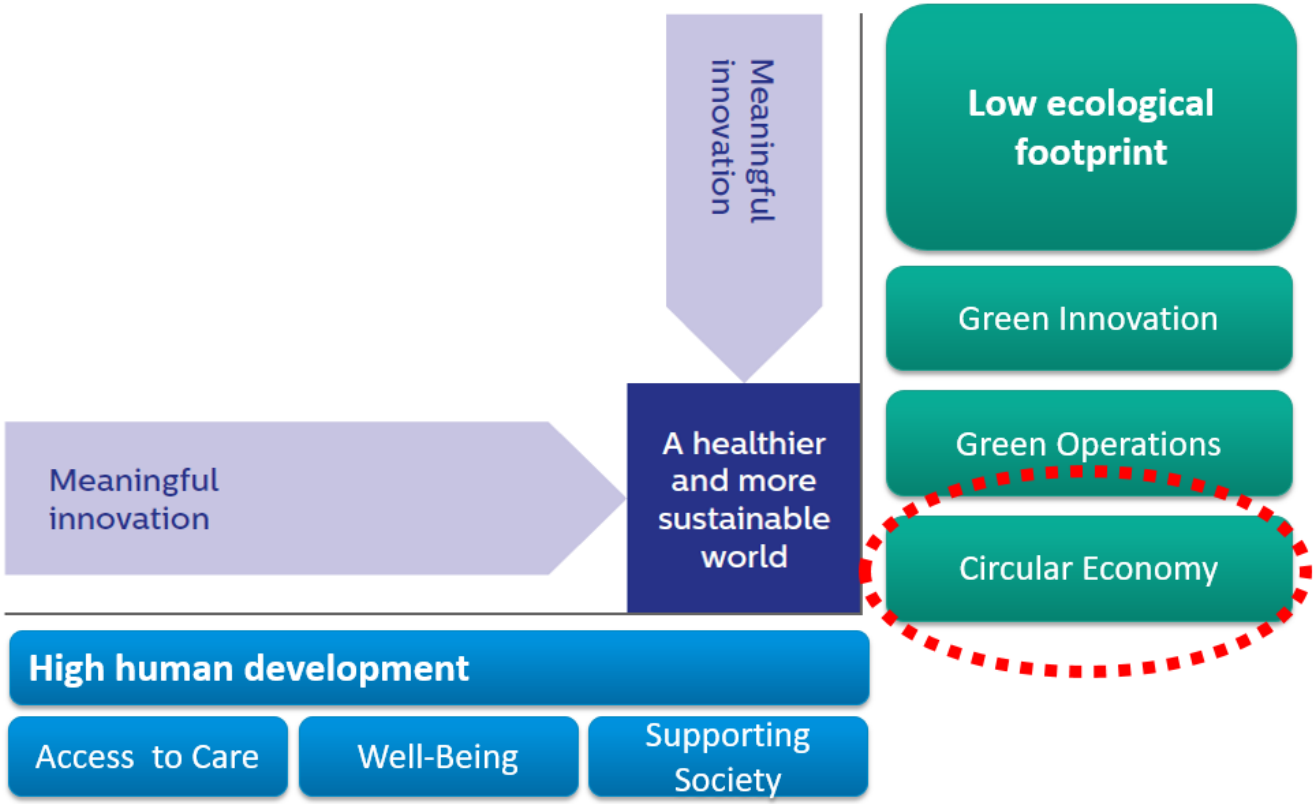


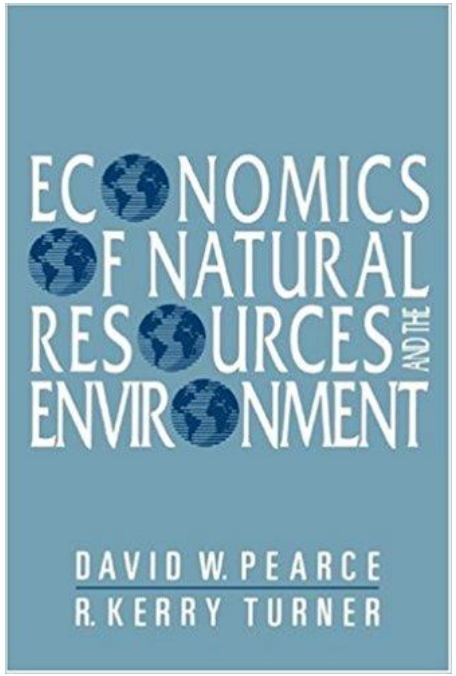
Introduction

Circular Economy in Manufacturing

What are the limitations of a Linear Economy?

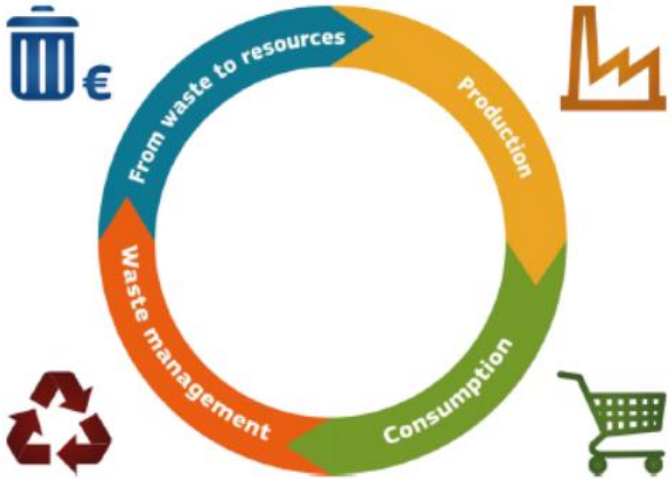
- lost value of materials and products
- scarcity of resources, volatile prices
- waste generated, environmental degradation & climate change

Circular Economy in Manufacturing



What is a Circular Economy?

- the value of products, materials and resources is maintained in the economy for as long as possible
- waste generation is minimised



European Commission

Circular Economy in Manufacturing

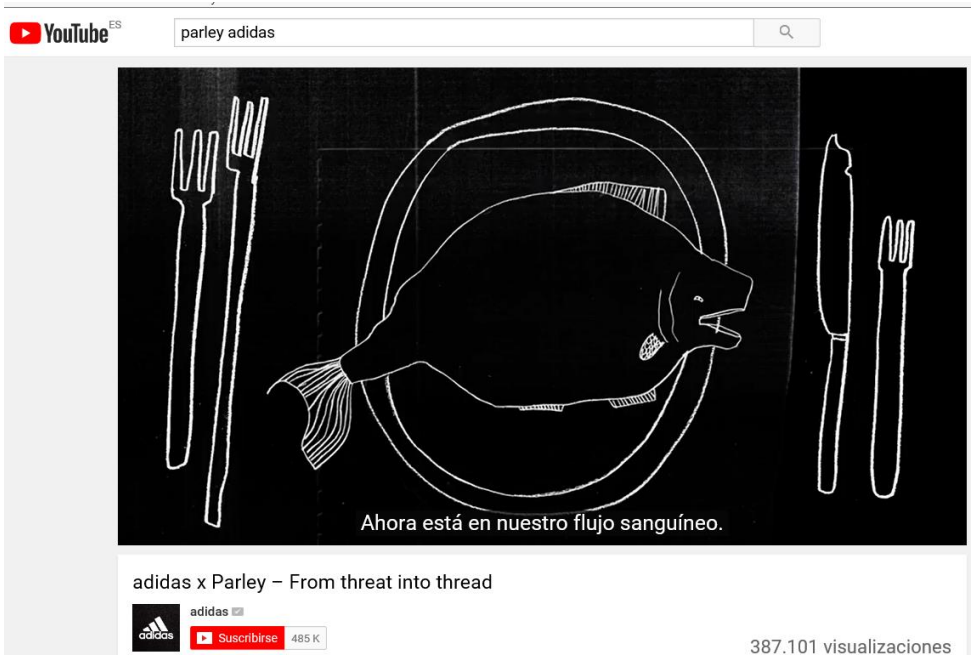
Circular Economy: expected benefits

- growth & **job creation** / up to +7% GDP
  - -up to **600 billion in savings** / 8% of annual turnover for business in the EU
  - -estimated **170 000 direct jobs** in waste management sectors created by 2035
- **boosting competitiveness** and ensuring security of supply
- building **economic and environmental resilience**
- encouraging **innovation**
- **reducing** total annual Greenhouse **Gas Emissions** by 2-4%
- in the EU it has been estimated that every 1% increase in resource efficiency is worth as much as 23 billion € for business and can create up to 200.000 jobs

The Circular Economy: The End of Business as Usual

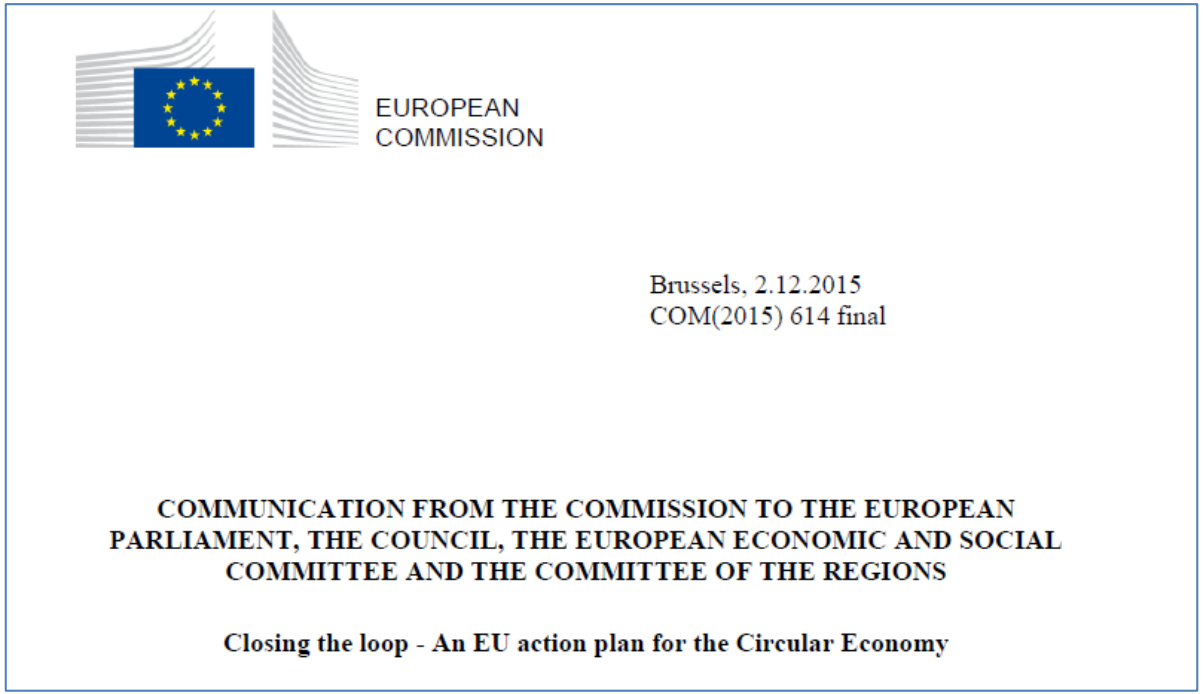
VIDEO 1: ADIDAS

adidas x Parley – From threat into thread



https://www.youtube.com/watch?v=iisMyJdkyqg

Circular Economy in Manufacturing



EUROPEAN
COMMISSION

Brussels, 2.12.2015
COM(2015) 614 final

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

Closing the loop - An EU action plan for the Circular Economy

Circular Economy in Manufacturing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Closing the loop - An EU action plan for the Circular Economy

Closing the loop

The legislative proposals on waste, adopted together with this action plan, include long-term targets to reduce landfilling and to increase preparation for reuse and recycling of key waste streams such as municipal waste and packaging waste. The targets should lead Member States gradually to converge on best-practice levels and encourage the requisite investment in waste management. Further measures are proposed to make implementation clear and simple, promote economic incentives and improve extended producer responsibility schemes.

By stimulating sustainable activity in key sectors and new business opportunities, the plan will help to unlock the growth and jobs potential of the circular economy. It includes

[1] *Growth within: a circular economy vision for a competitive Europe*, report by the Ellen MacArthur Foundation, the McKinsey Centre for Business and Environment and the Stiftungsfonds für Umweltökonomie und Nachhaltigkeit (SUN), June 2015.

Circular Economy in Manufacturing


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An EU action plan for the Circular Economy

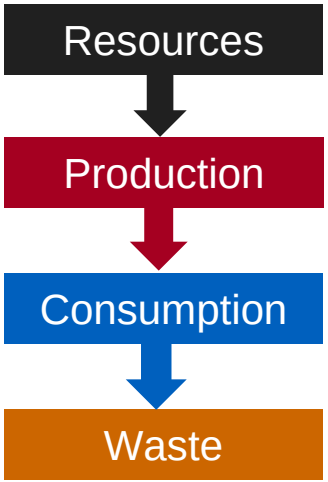
Closing the loop

comprehensive commitments on ecodesign, the development of strategic approaches on plastics and chemicals, a major initiative to fund innovative projects under the umbrella of the EU's Horizon 2020 research programme, and targeted action in areas such as plastics, food waste, construction, critical raw materials, industrial and mining waste, consumption and public procurement. Other key legislative proposals on fertilisers and water reuse will follow. Finally, horizontal enabling measures in areas such as innovation and investment are included to stimulate the transition to a circular economy. The proposed actions support the circular economy in each step of the value chain – from production to consumption, repair and remanufacturing, waste management, and secondary raw materials that are fed back into the economy. The actions proposed will be taken forward in line with Better Regulation principles, and subject to appropriate consultation and impact assessment.

The action plan focusses on action at EU level with high added value. Making the circular economy a reality will however require long-term involvement at all levels, from Member States, regions and cities, to businesses and citizens. Member States are invited to play their

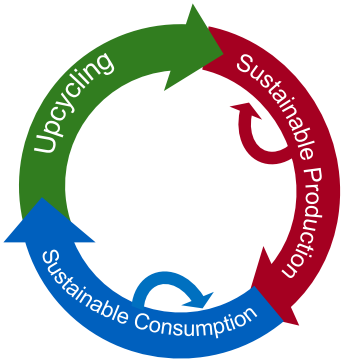
Circular Economy in Manufacturing

Linear economy



Chain economy

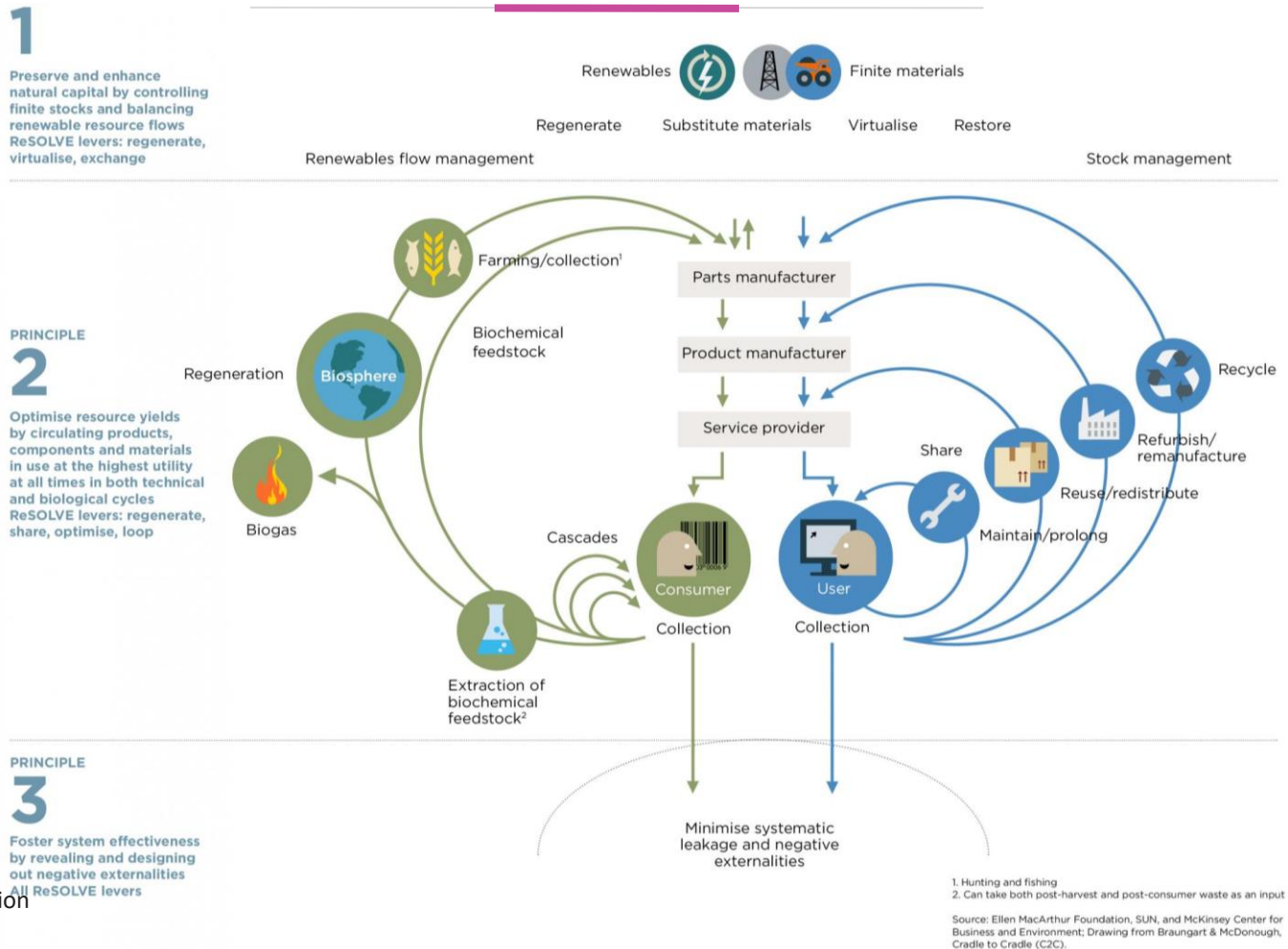
Circular economy



From waste to resources

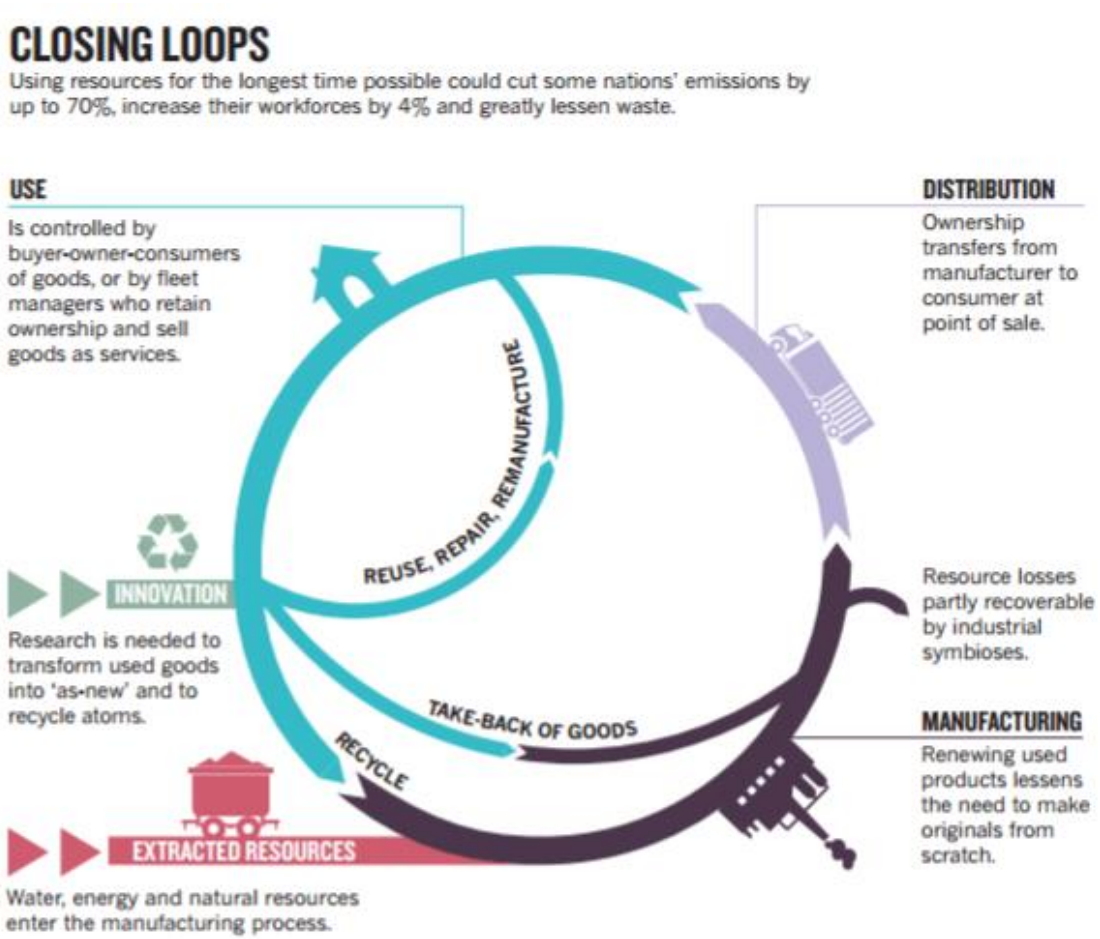
Extracted from ACR+

Circular Economy in Manufacturing



Ellen Macarthur Foundation

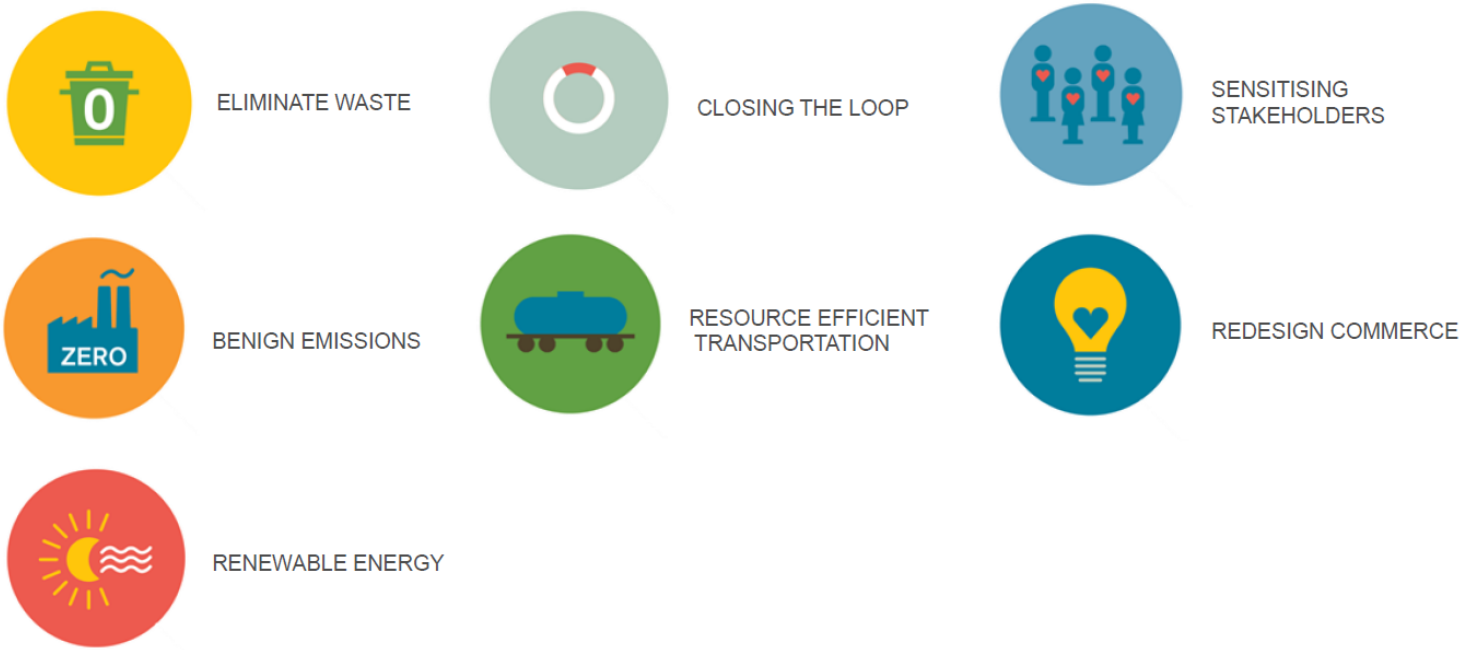
Circular Economy in Manufacturing



Stahel (2016)

Circular Economy Implementation

System Thinking in 7 Fronts



Interface®

Extracted from: “From Restorative to Regenerative Creating a sustainable, inclusive, biobased and circular economy by learning from nature, 2017”

VIDEO 2: RE-THINKING PROGRESS: THE CIRCULAR ECONOMY

https://www.youtube.com/watch?v=zCRKvDyyHmI

Circular Economy Implementation

Territorial hierarchy

Extracted from ACR+

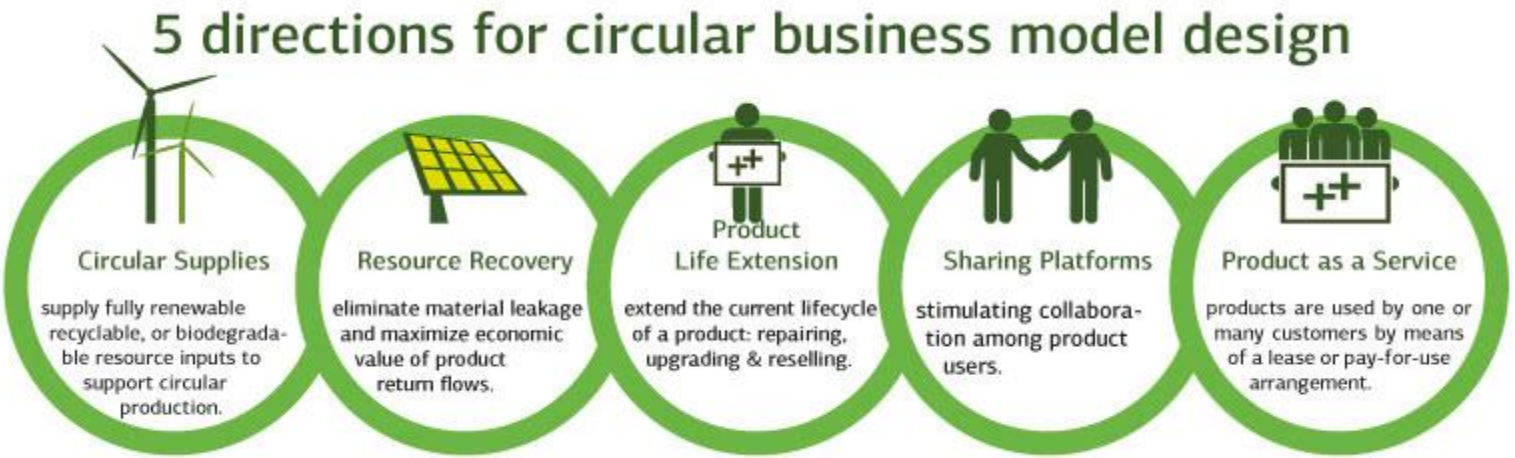
Circular Economy Implementation

The role of LRAs

Extracted from ACR+

Circular Economy Implementation

New business models



Extracted from PRE

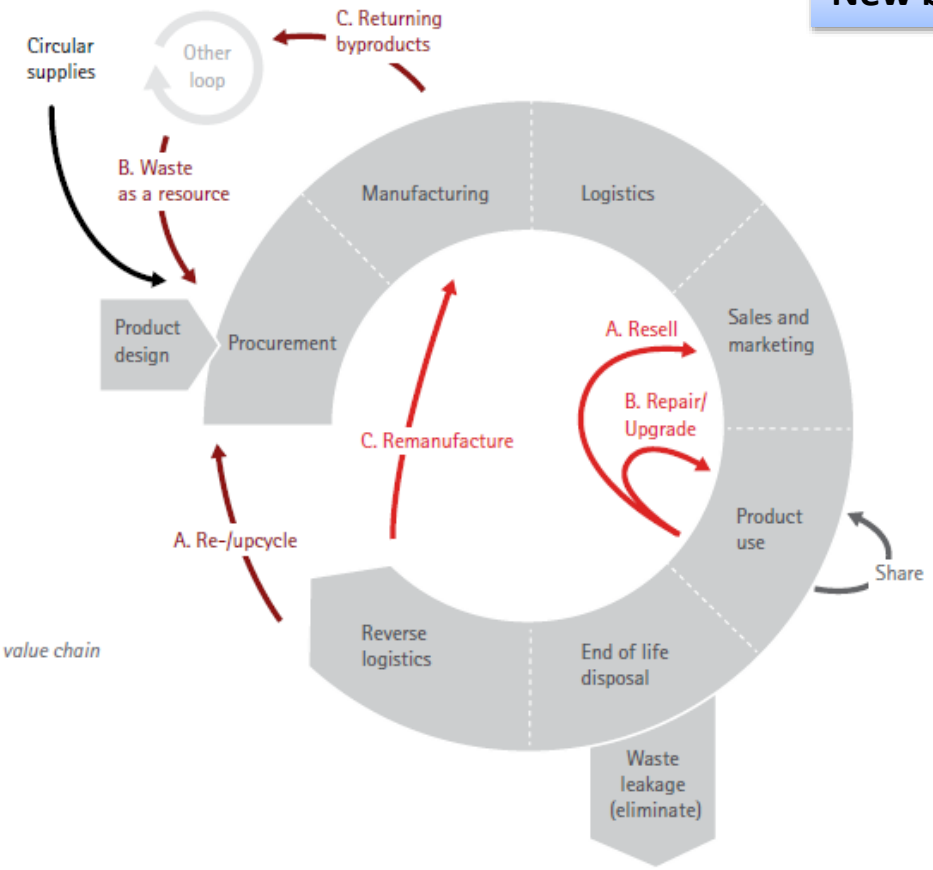
Circular Economy Implementation

New business models

Business Models

- **Circular Supplies:** Provide renewable energy, bio based- or fully recyclable input material to replace single-lifecycle inputs
- **Resource Recovery:** Recover useful resources/energy out of disposed products or by-products
- **Product Life Extension:** Extend working lifecycle of products and components by repairing, upgrading and reselling
- **Sharing Platforms:** Enable increased utilization rate of products by making possible shared use/access/ownership
- **Product as a Service*:** Offer product access and retain ownership to internalise benefits of circular resource productivity

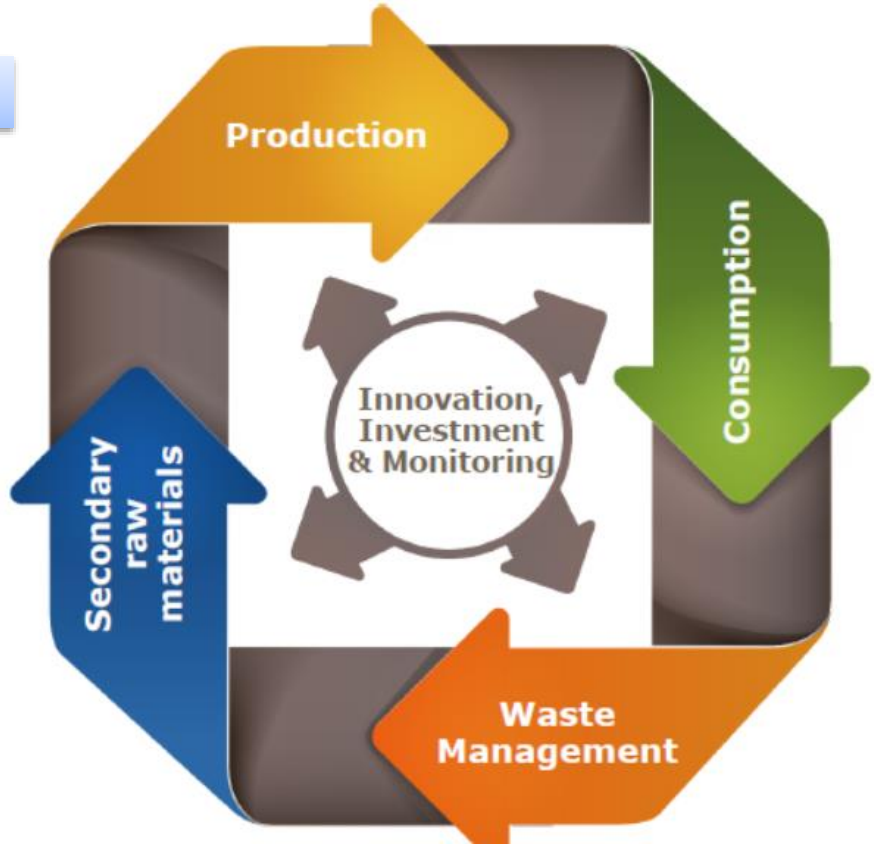
** Can be applied to product flows in any part of the value chain*



Extracted from Accenture

Circular Economy Implementation

UE Key Action Areas



Extracted from EC

Circular Economy Implementation

UE Key Action Areas

Production

Objectives

- provide incentives to boost circular product design
- innovative and efficient production processes

Key actions

- durability, reparability and recyclability of products – Ecodesign Directive, Extended Producer Responsibility
- best practices for waste management and resource efficiency in industrial sectors - BREFs
- industrial symbiosis, remanufacturing
- More coherent policy framework for products, tools for SMEs

Consumption

Objectives

- repair and reuse of products
- reliable information to consumers

Key actions

- better labelling: EU Eco-label, Environmental Footprint
- new forms of consumption – collaborative economy, digital platforms
- guarantees and action on false green claims
- independent testing programme to assess possible planned obsolescence
- Circular Economy criteria in Green Public Procurement

Market for secondary raw materials

Objectives

- increase the use of secondary raw materials
- increase the use of recycled nutrients and water
- safely managed chemicals
- improve knowledge of material flows

Key actions

- EU regulation on fertilisers
- legislative proposal on minimum requirements for reused water
- quality standards for secondary raw materials
- analysis on the interface between chemicals, product, and waste legislation
- EU-wide electronic system for cross-border transfers of waste

Waste management

Objectives

- improve waste management in line with the EU waste hierarchy
- address existing implementation gaps
- provide long-term vision and targets to guide investments

Key actions

- revised EU targets for recycling 65% of municipal waste and 75% of packaging waste by 2030
- new binding target to reduce landfill to a maximum of 10% of total waste by 2030
- improve waste management, new investments in recycling capacity, avoid overcapacity in incineration and mechanical-biological treatment
- ensure coherence between waste investments under EU Cohesion Policy and the waste hierarchy

Extracted from EC

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Thank you!

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