"Circular Economy Business Models for the Manufacturing Industry"

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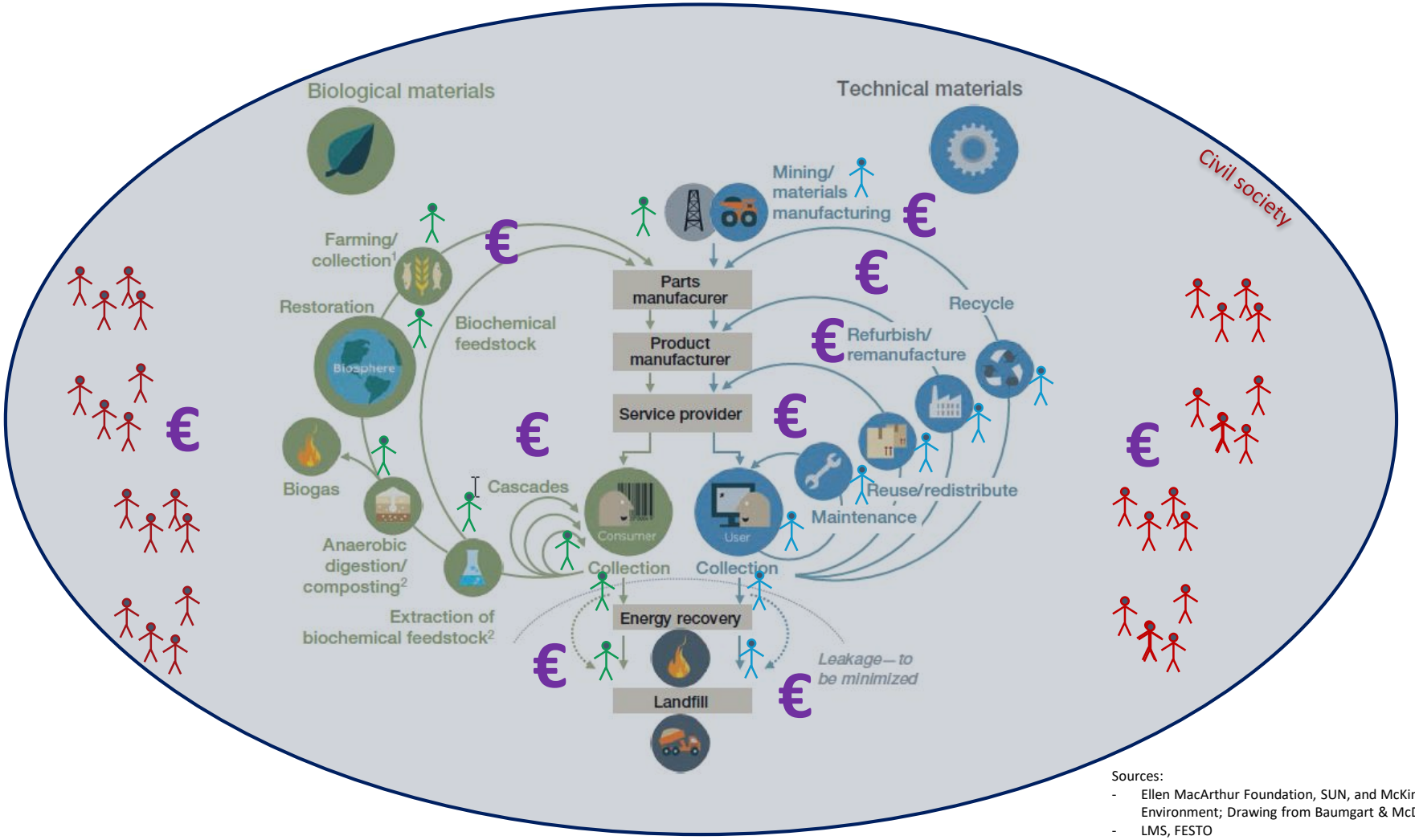
Towards the Circular Economy

In January 2012, a report was released entitled *Towards the Circular Economy: Economic and business rationale for an accelerated transition*. The report, commissioned by the Ellen MacArthur Foundation and developed by McKinsey & Company, was the first of its kind to consider the economic and business opportunity for the *transition to a restorative, circular model*. Using product case studies and economy-wide analysis, the report details the potential for significant benefits across the EU. It argues that a subset of the EU manufacturing sector could realize net materials cost savings worth up to $630 billion annually towards 2025—stimulating economic activity in the areas of product development, remanufacturing and refurbishment.

Towards the Circular Economy also identified the key building blocks in making the transition to a circular economy, namely in skills in circular design and production, new business models, skills in building cascades and reverse cycles, and cross-cycle/cross-sector collaboration.

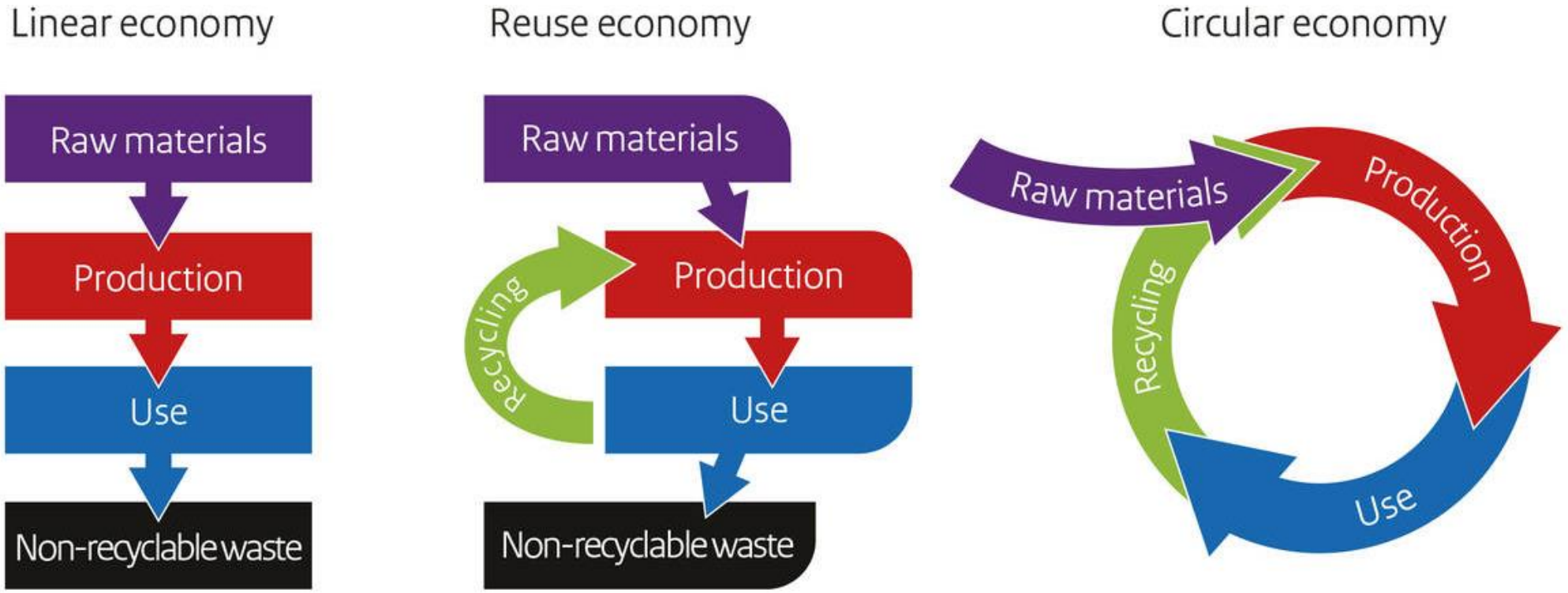
Change in climate has recently strongly grown attention on Circular Economy

Circular Economy - Ecological + Societal + Economical



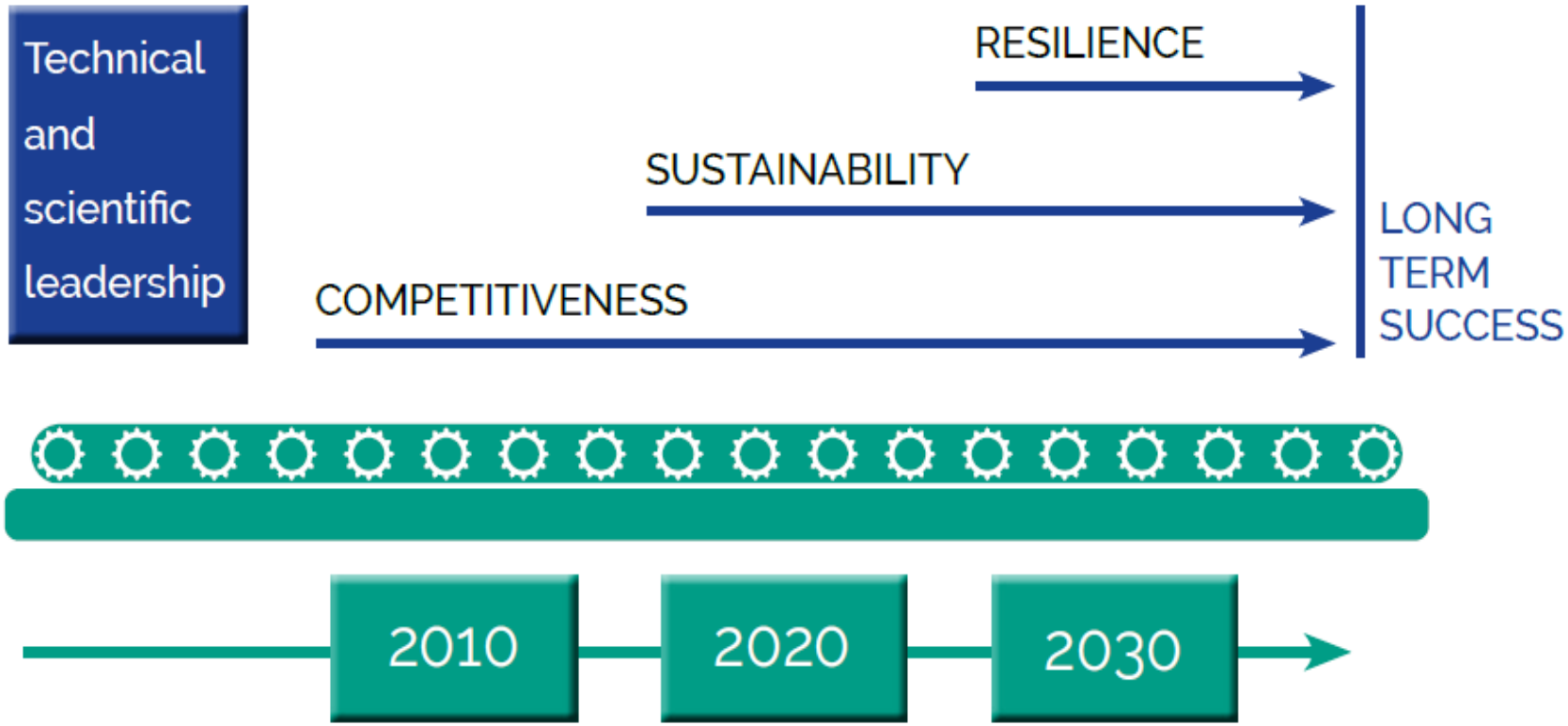
Sources:
- Ellen MacArthur Foundation, SUN, and McKinsey Center for Business and Environment; Drawing from Baumgart & McDonough, Cradle to Cradle (C2C)
- LMS, FESTO
- FUTURING Consortium

From a linear to a circular economy



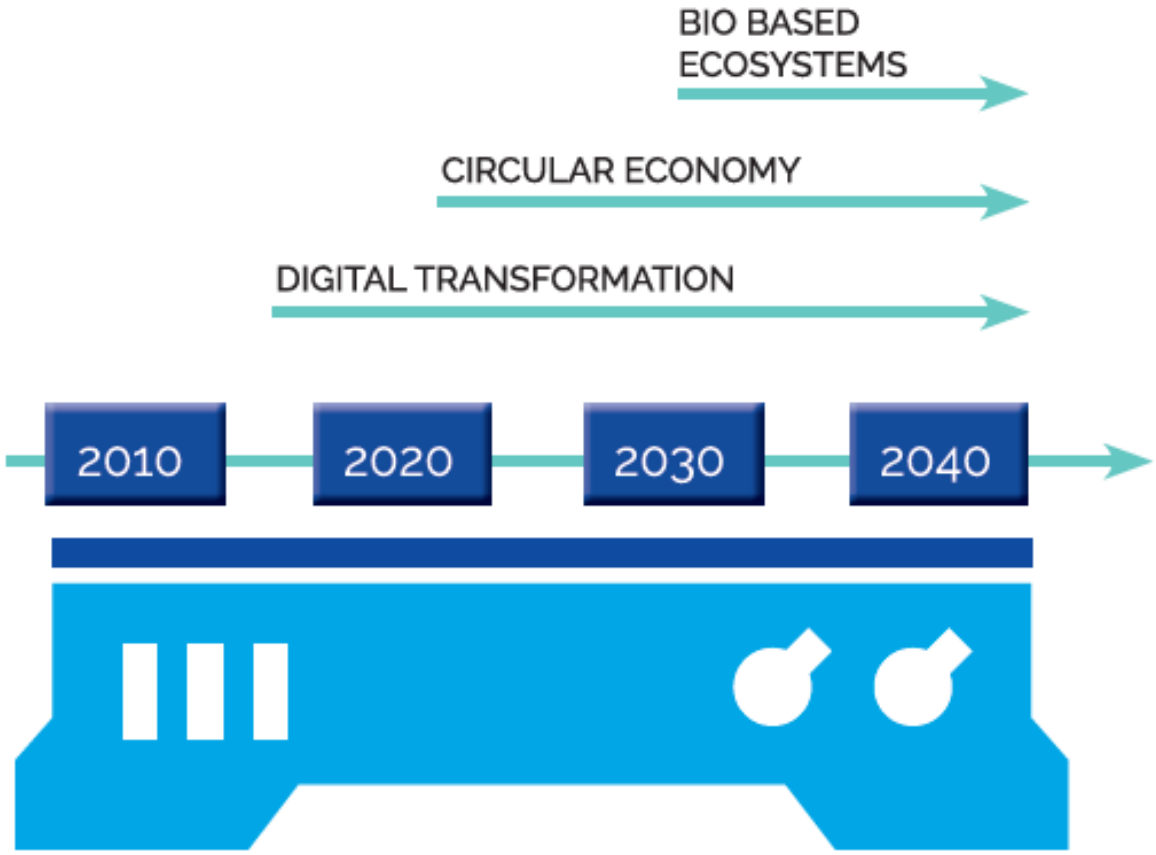
A sustainable world does not mean a drop in the quality of life for consumers, and can be achieved without loss of revenue or extra costs for manufacturers. The argument is that circular business models can be as profitable as linear models, allowing us to keep enjoying similar products and services.

Manu*FUTURE* VISION 2030 and Strategy



Implementation Roadmap

Three transformational waves



16 Principles For a Circular Economy:

1 Design with a purpose
2. Design for longevity

3. Design for resource efficiency
4. Design for biodegradability
5. Design for recyclability

6. Source/produce more locally
7. Source/produce more without toxicity

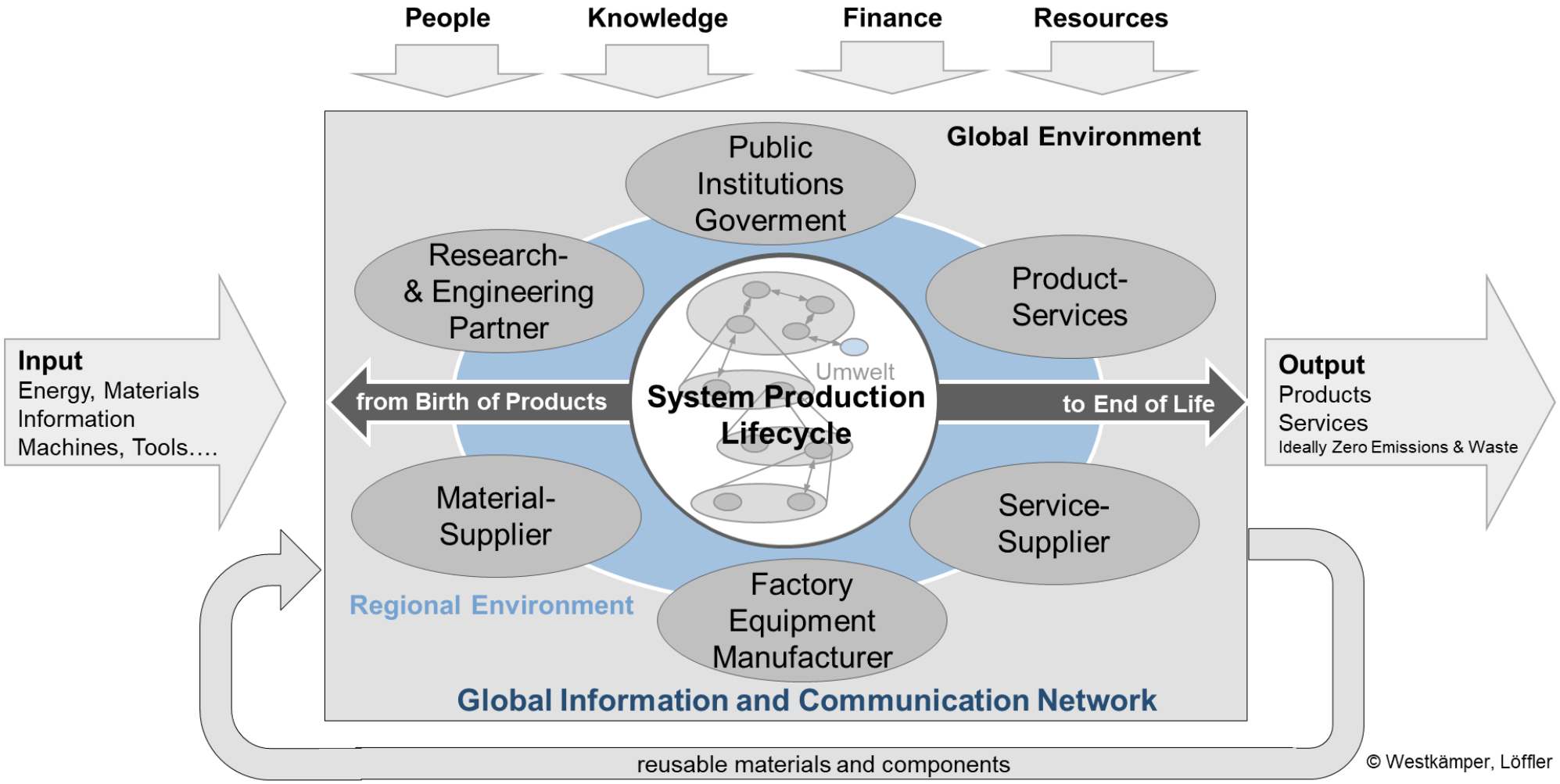
8. Source/produce with efficiency
9. Source/produce with renewables

10. Source/produce with good ethics
11. Provide services to support long life

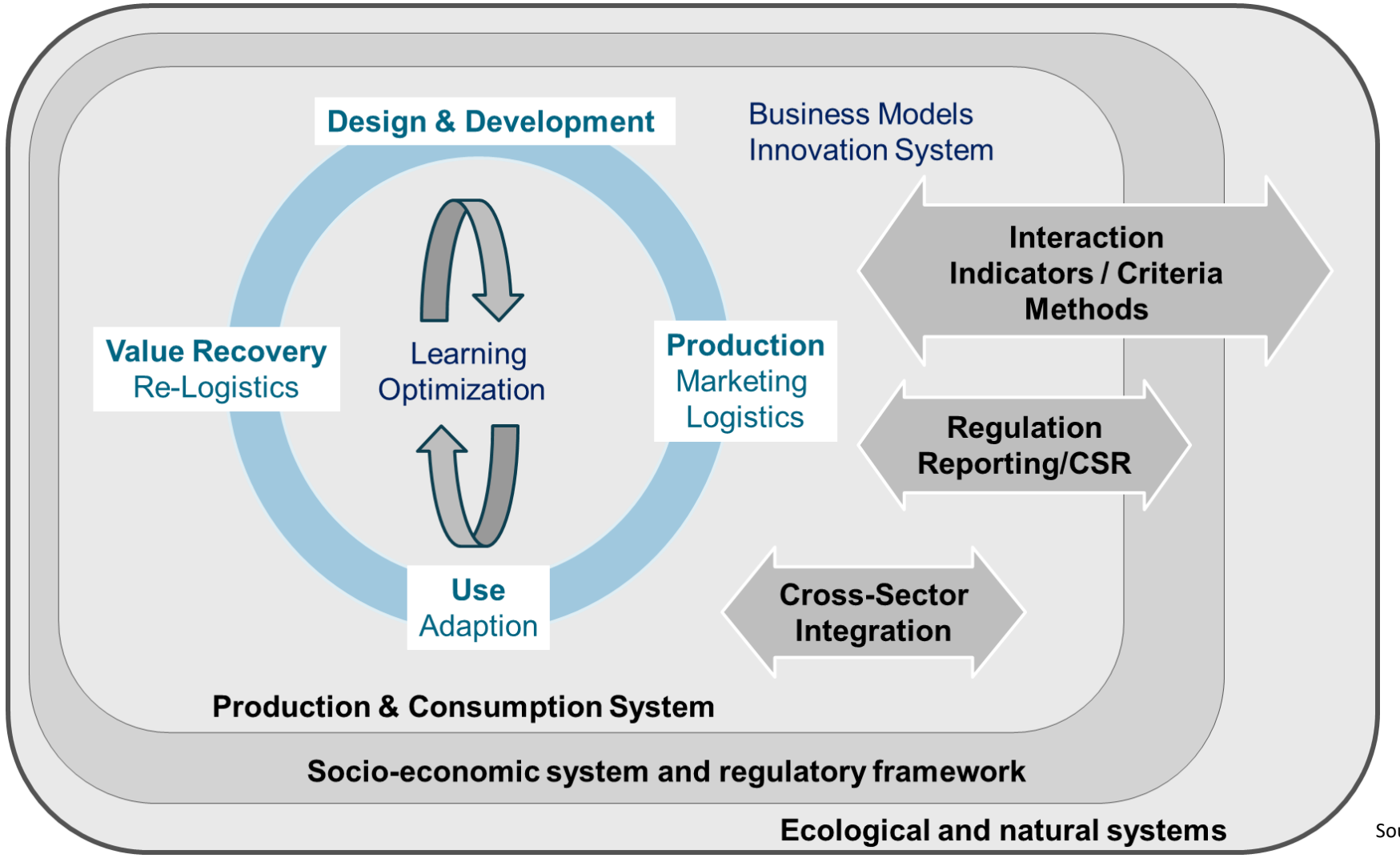
12. Reuse, recycle and compost all remains
13. Collaborate well and widely

14. Use, wash and repair with care
15. Consider rent, loan, swap, second-hand or redesign
16. Buy quality as opposed to quantity

The System of Manufacturing

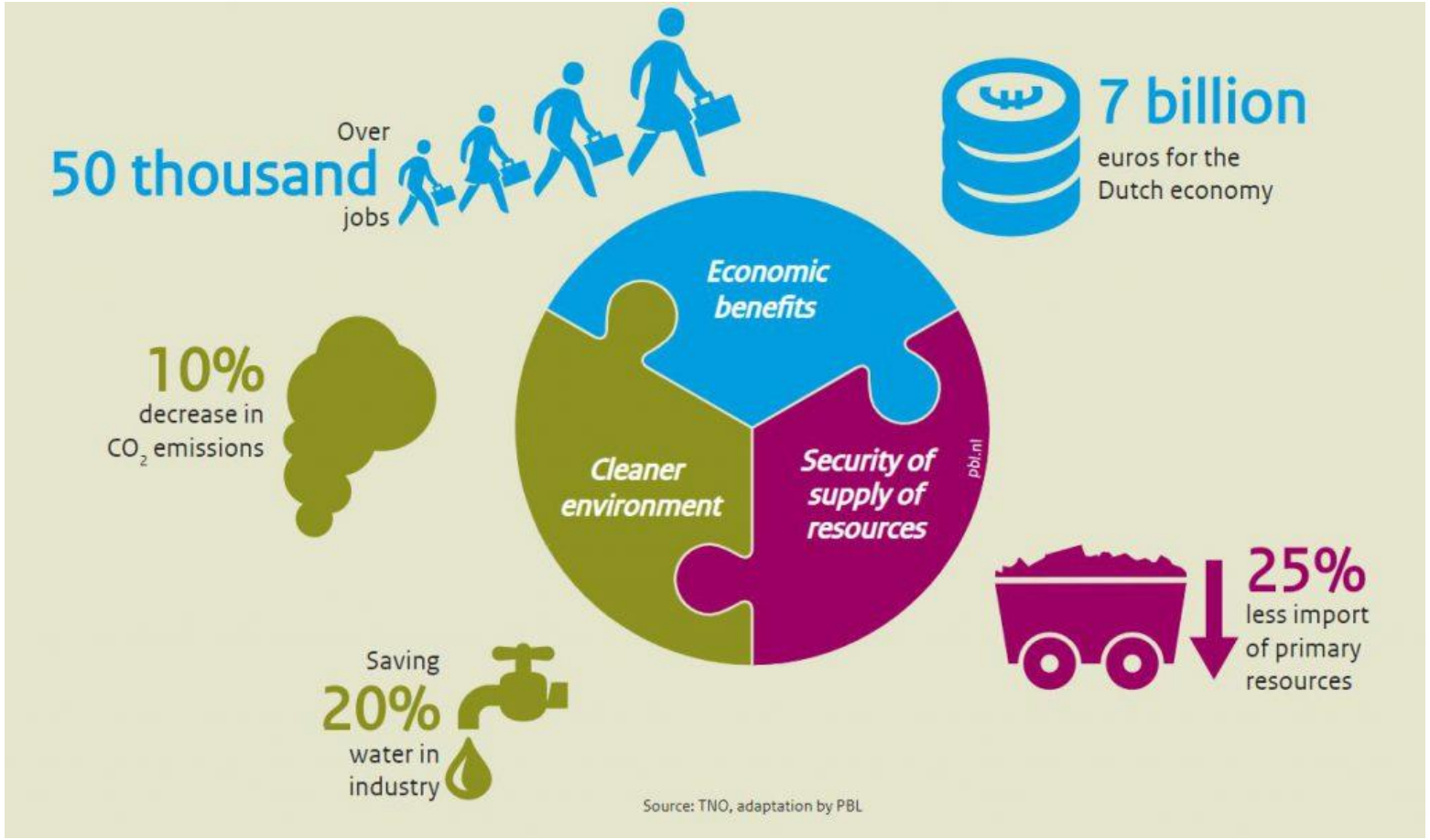


Levels to be integrated for an effective circular economy



Source: VDMA

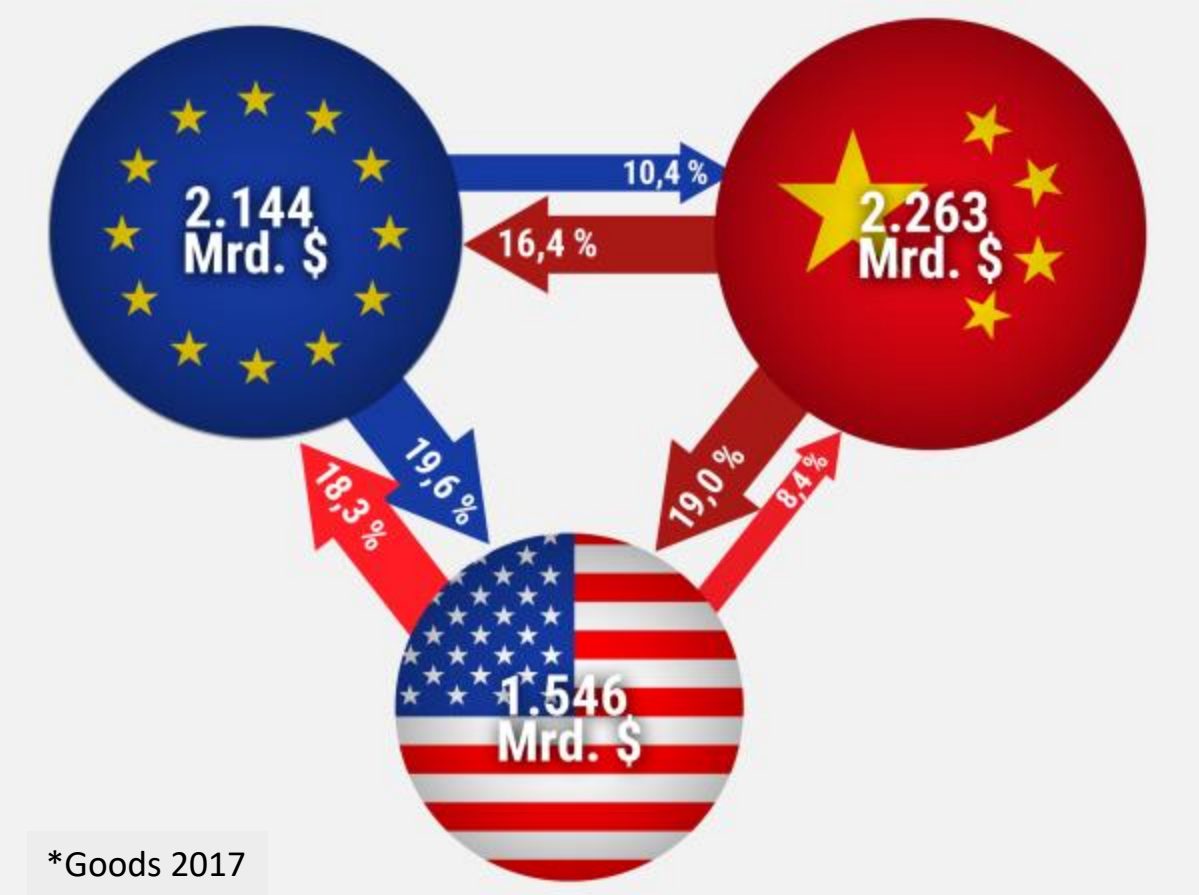
What are the expected benefits of Circular Economy for the Netherlands



How to coexist Competition and Circular Economy in a challenging worldwide scenario ?

"***commoditization***" defined as the process by which goods that have economic value and are distinguishable in terms of attributes (uniqueness or brand) end up becoming simple commodities in the eyes of the market – source Wikipedia

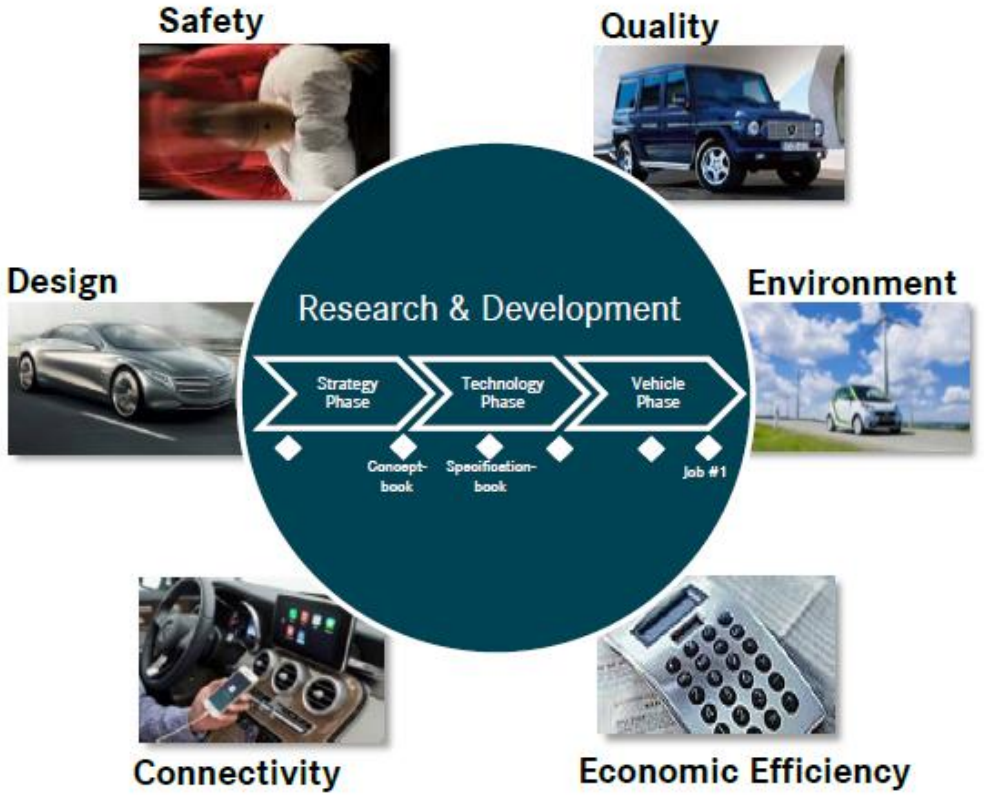
Interlocked global economy - volume of goods exports by China, the EU and the USA in billions of US dollars and proportionally to each other in percent

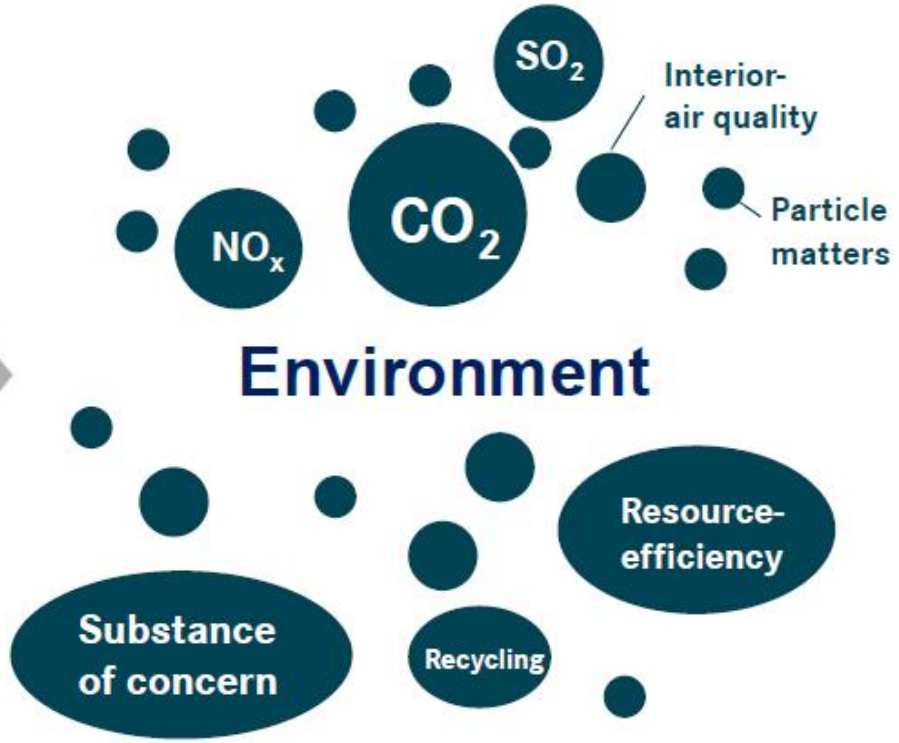


Source: UNCTAD 2019

Elements of the environmental management system R&D with focus on design for environment

Challenges for research & development of automobiles



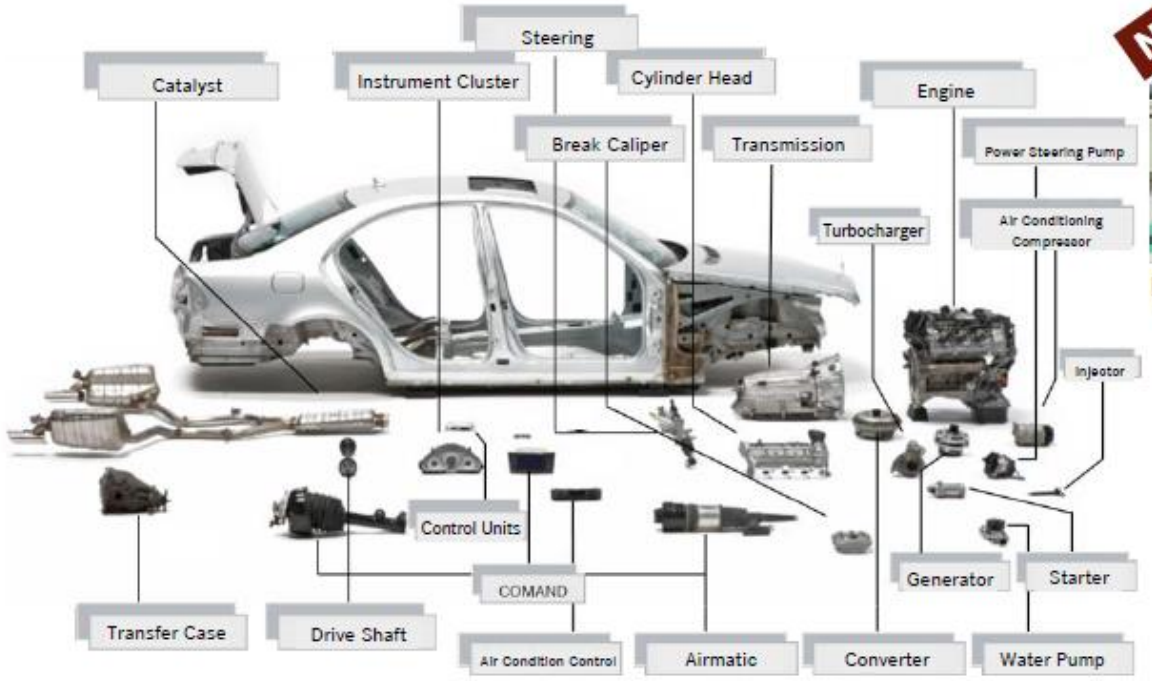


Balancing of disparate requirements in a permanent task in Research & Development

Within the different environmental targets contradictory effects are possible

Remanufacturing - New Life for Used Parts

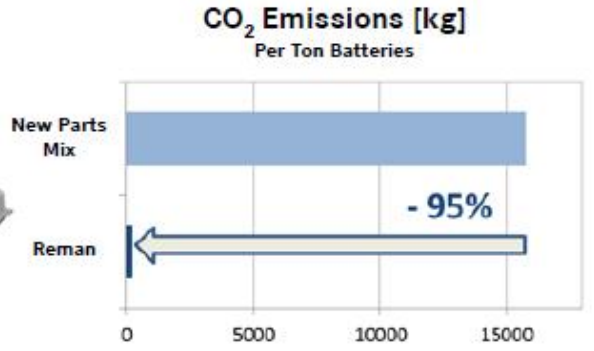
Over 12,000 Parts in Reman Portfolio - incl. E-Drive Components...



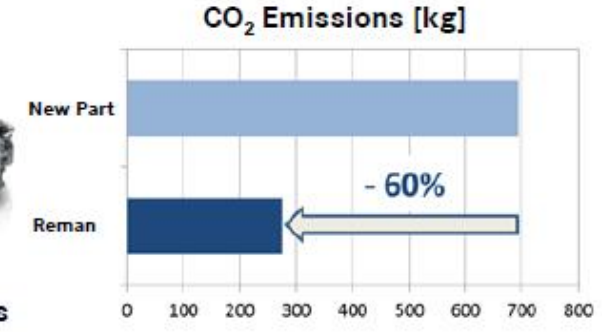
Reman-Prozess HV-Batteries for E-Drive Passenger Cars – Plant Mannheim

...with significant environmental benefits

High-Voltage Battery-Mix



Exchange Transmissions G281



…. Food for thoughts : regulations, marks, standards, labels for all products distributed in Europe

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- Product lifetime guaranteed at least 10 years (local service available)
- No “programmed obsolescence”
- Firmware downloadable for electronic boards repair
- Carbon footprint decreased in production process during last 3 years
- Use of green materials
- …… open for contribution

Circular Economy will open up new opportunities for growth, shareholder value, and benefits to society and the planet. CEOs and their boards can wait to be pushed into this agenda by competitors, customers, and regulators. Or they can embrace it proactively and use it to reinvent the company, reshape the industry, propel the stock, deliver remarkable impact, and leave a notable legacy of corporate public good.


Thank you