Circular Economy - How to connect policy, research and business?

Milano

Digitalization as enabler of the resource efficient circular economy?

May 10, 2019

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Director Circular Economy
Wuppertal Institute for Climate, Environment, Energy

From waste management to circular systems

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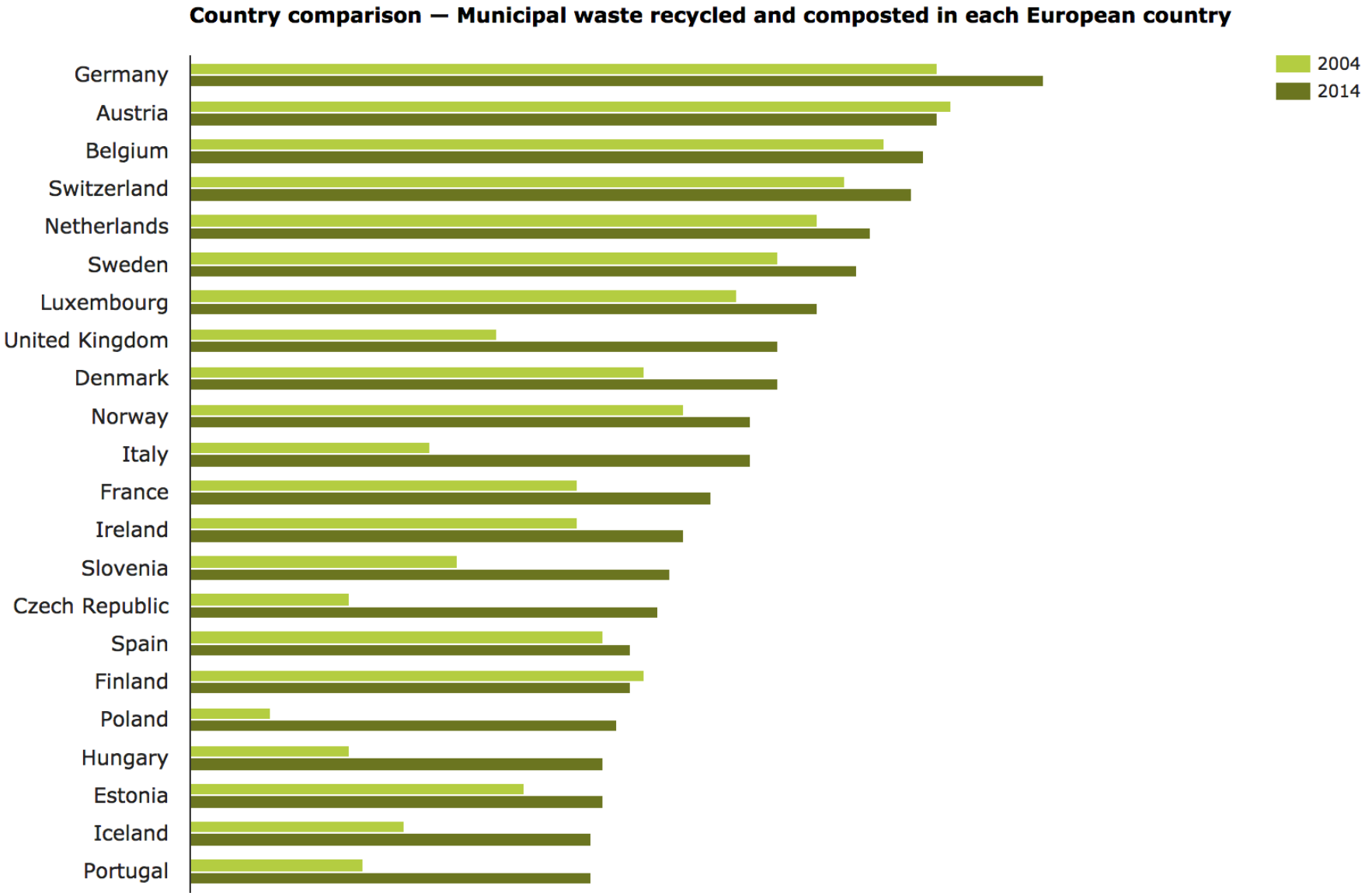
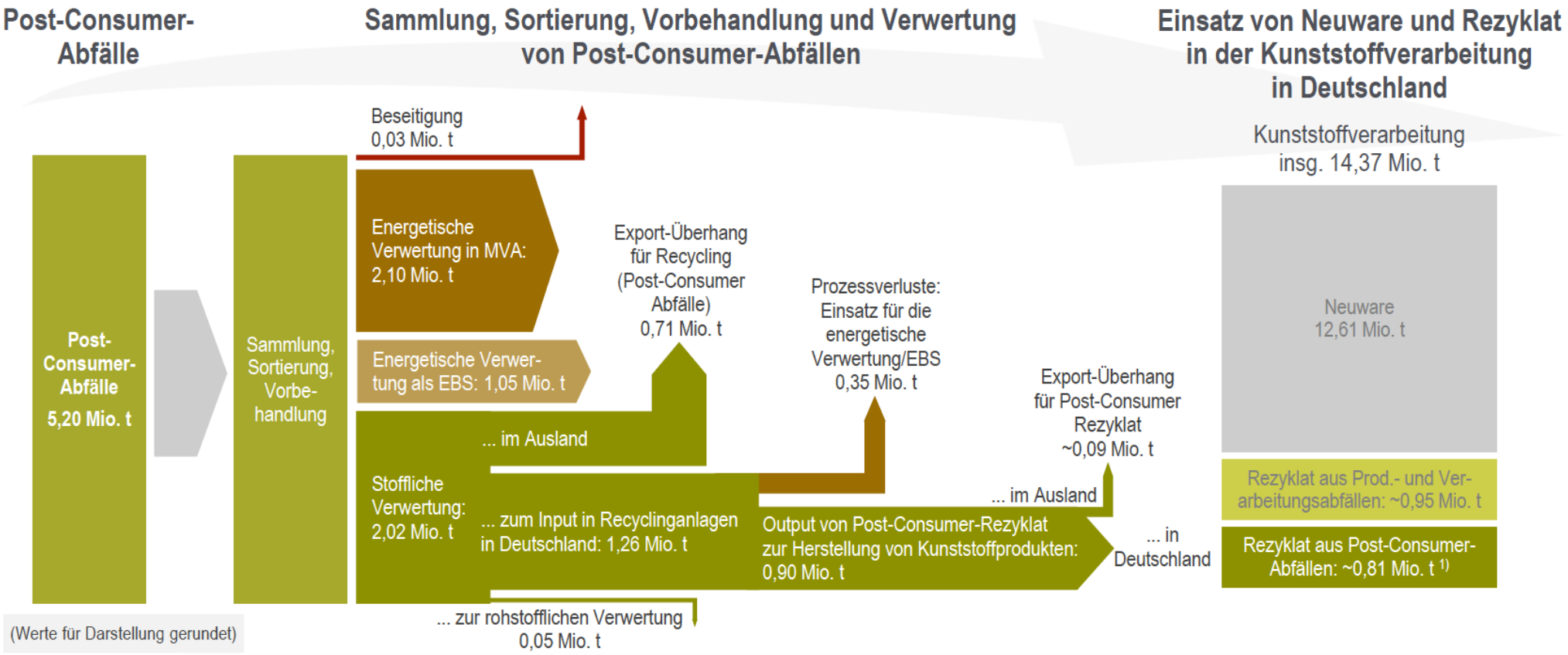


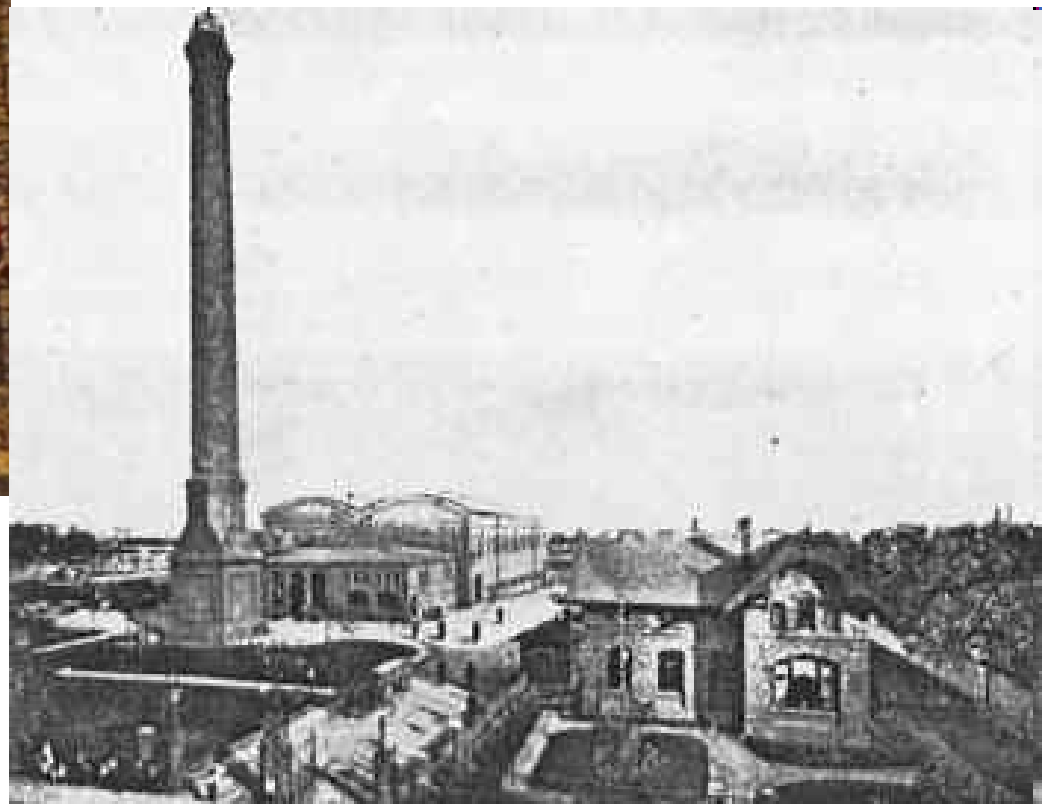
Source: EEA 2018

What do recovery rates actually tell us?
Germany: 99,2% for plastic packaging...



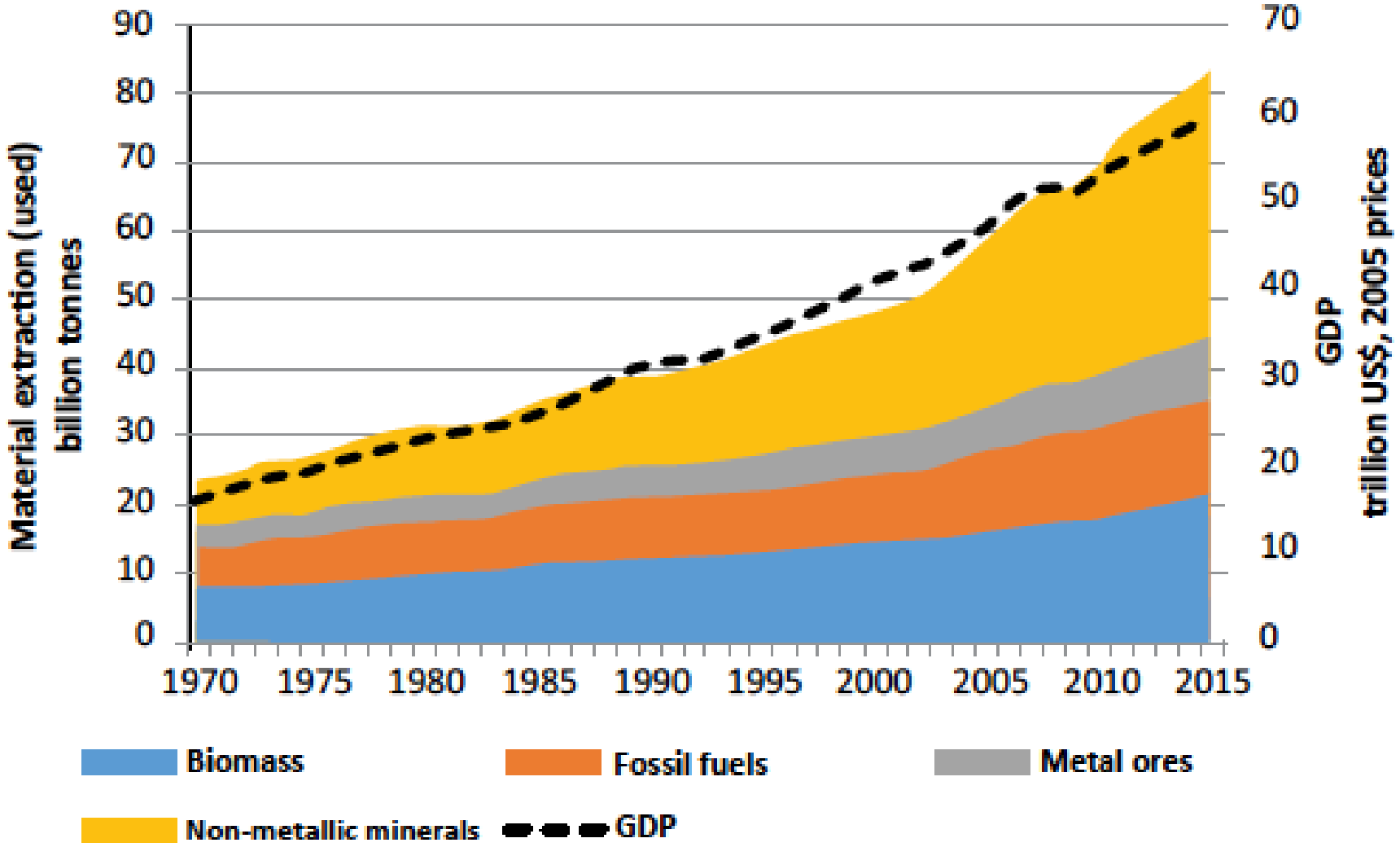
Goal: safe disposal of waste

http://www.br-online.de/bildung/databrd/mittel7.htm/mit7b20.jpg



www.srhh.de

Goal: sustainable use of resources



Source: UNEP 2017

Resource protection through circular economy

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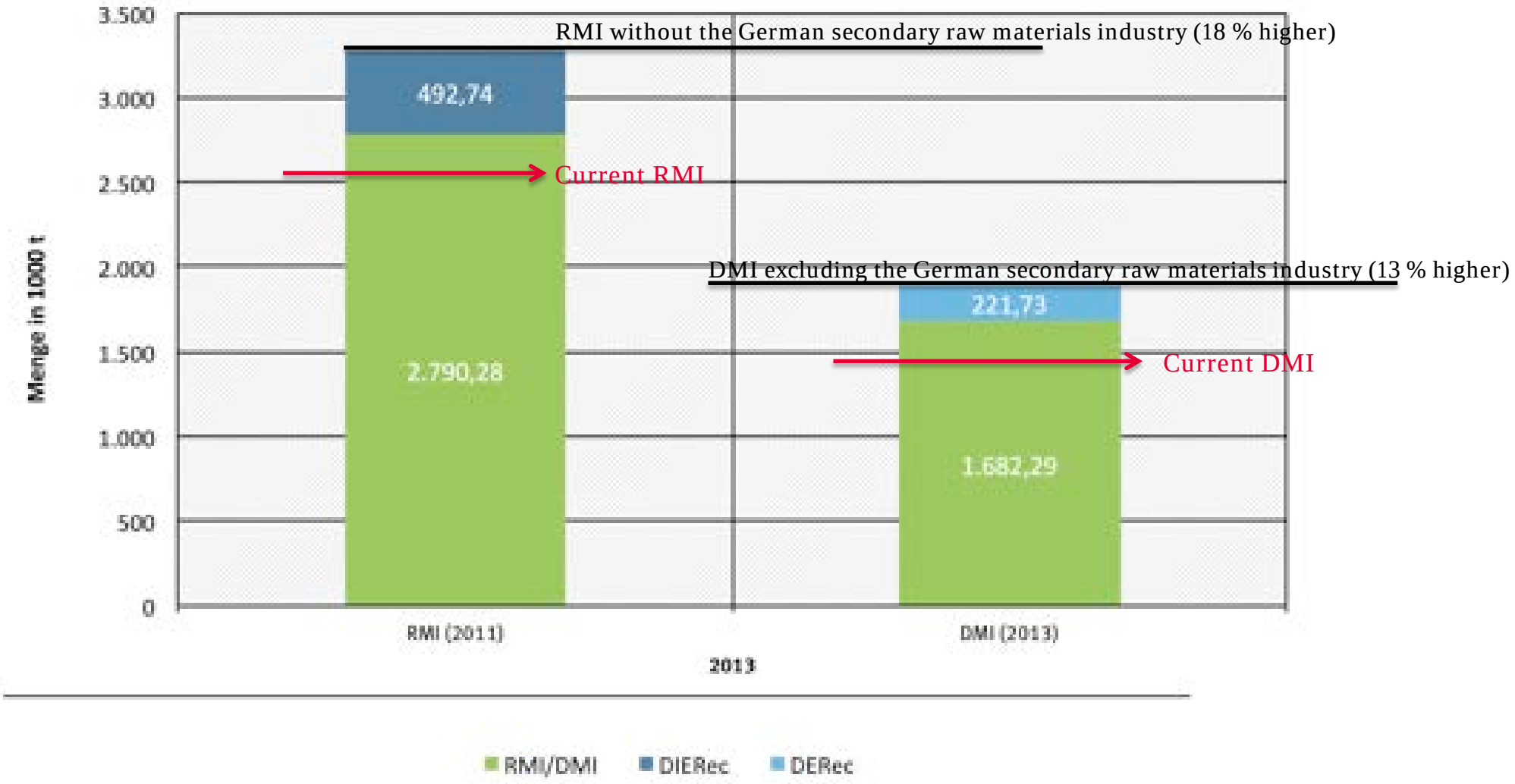
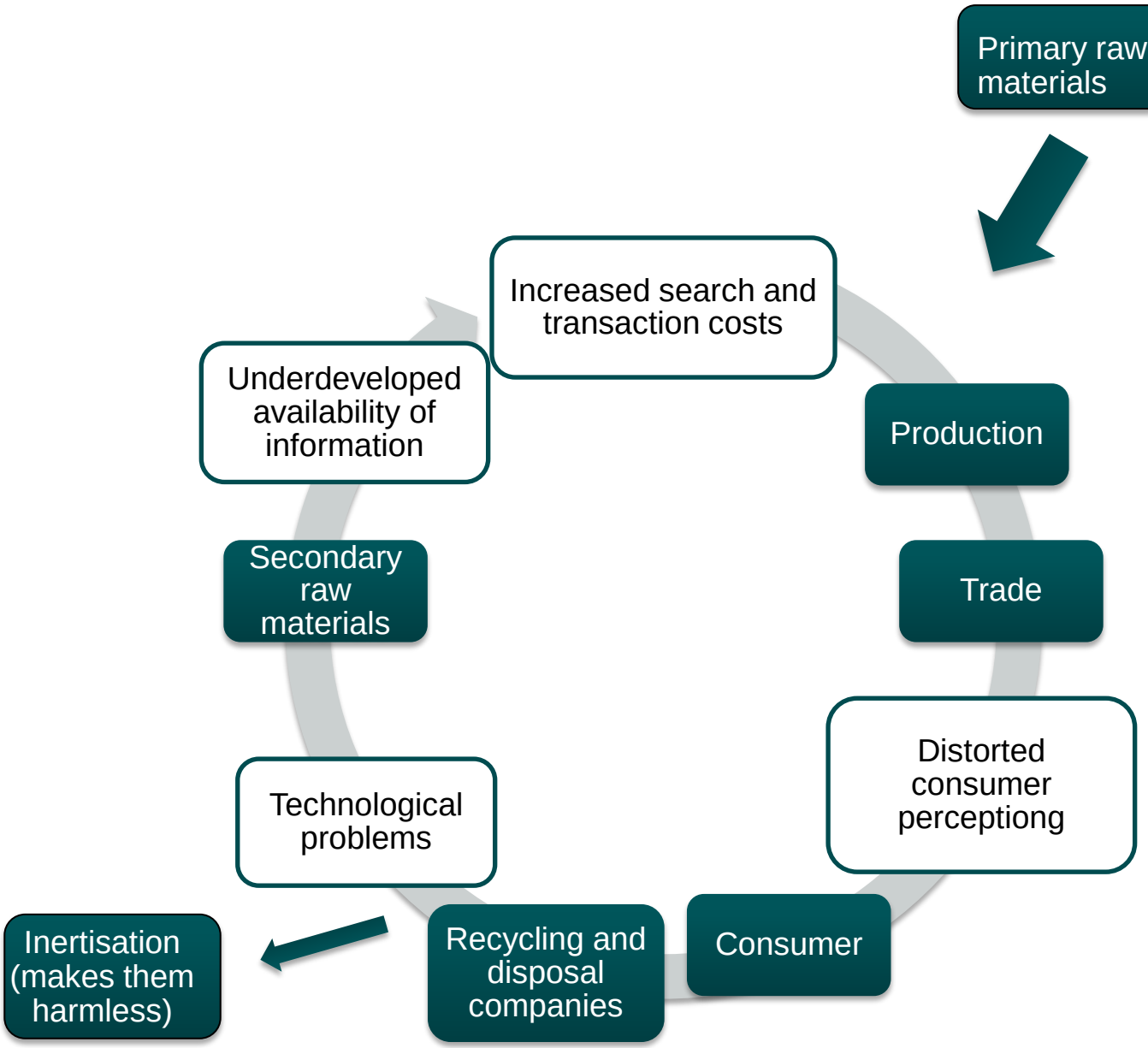
Reduction of the theoretical raw material requirement by the secondary raw material economy

DIERec and DERec in relation to DMI and RMI

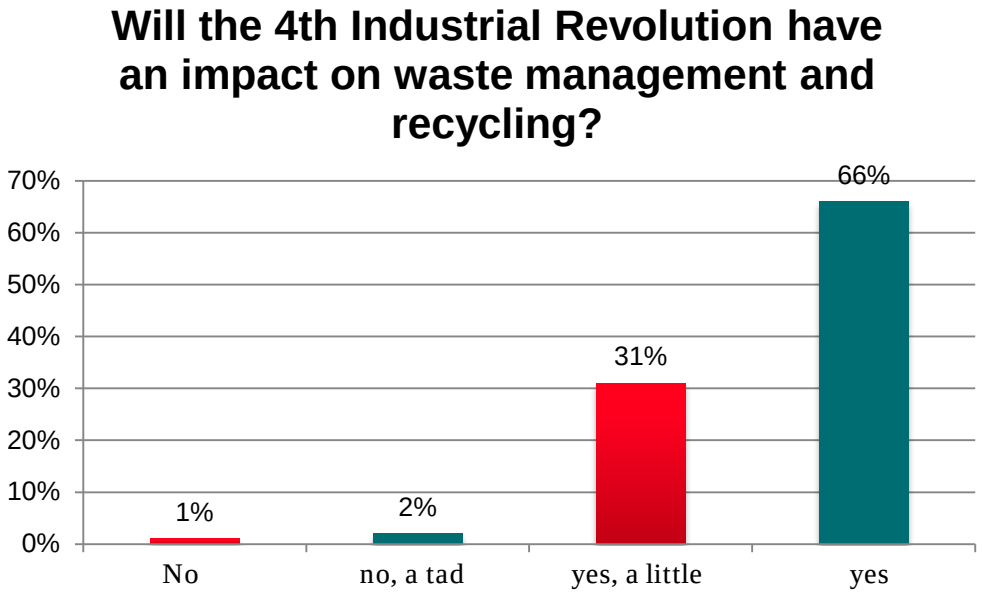


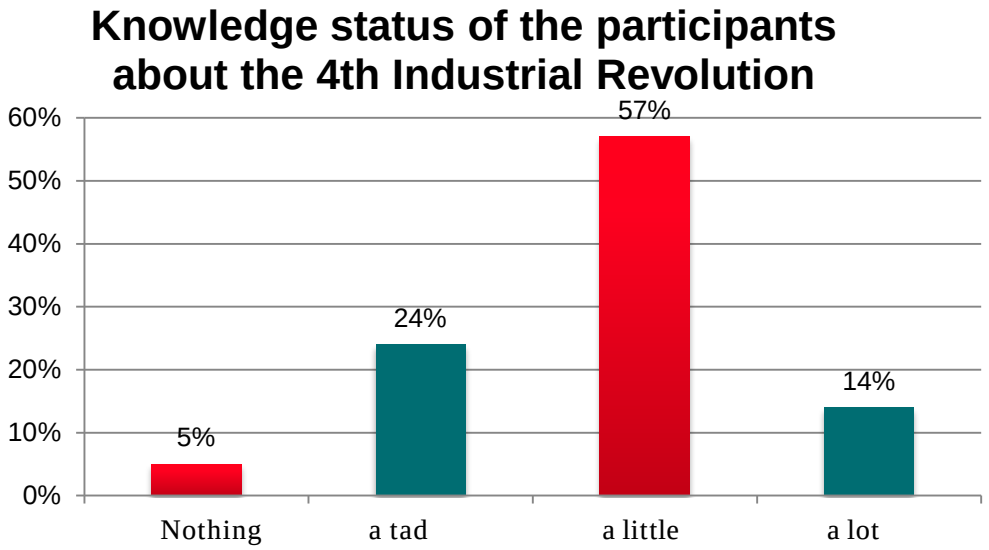
Barriers in the circular economy



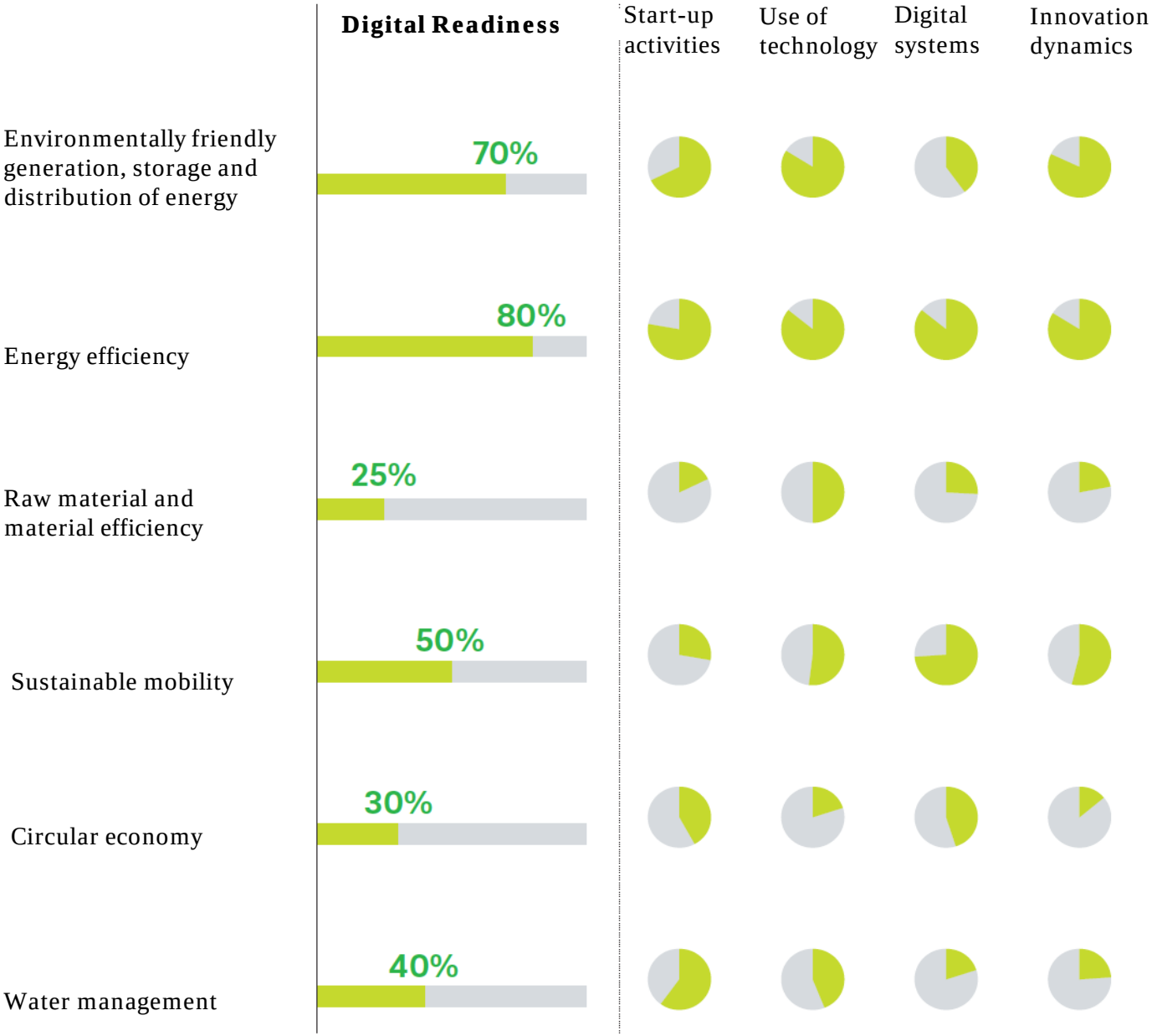
ISWA Study on waste management of the future

Digitization of the circular economy





„Digital Readiness in Comparison of Environmental Technologies“



Source: Roland Berger 2017 (Translated)

Digital transformation offers itself as an ideal precursor of a circular economy

Practical considerations

Sensoring

- Real-time data collection and generation
- automated market and logistics platforms (“UBER for waste")

Cyber Physical Systems

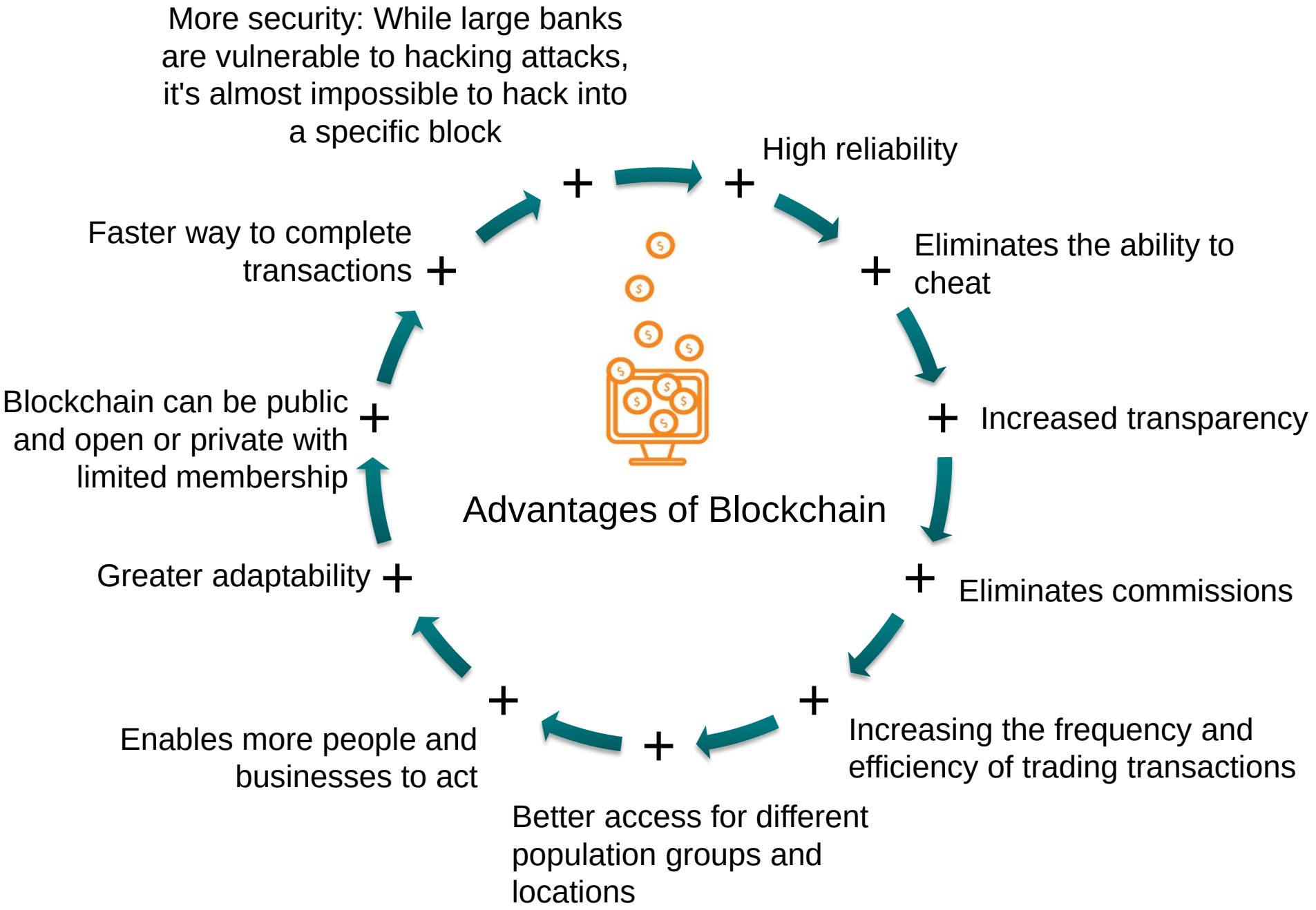
- Information about products throughout the entire production process

Block Chain

- Waste data flows without inference to production technology

Internet of Things

- Self-marketing of recycled products


More security: While large banks are vulnerable to hacking attacks, it's almost impossible to hack into a specific block
High reliability
Eliminates the ability to cheat
Increased transparency
Eliminates commissions
Increasing the frequency and efficiency of trading transactions
Better access for different population groups and locations
Enables more people and businesses to act
Greater adaptability
Blockchain can be public and open or private with limited membership
Faster way to complete transactions
Advantages of Blockchain

Feasibility study in the context of ClimateKIC: Blockchain-based deposit solutions

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The blockchain approach as business model for deposit solutions in densely populated, optimally isolated regions (e.g. tourist island destinations)

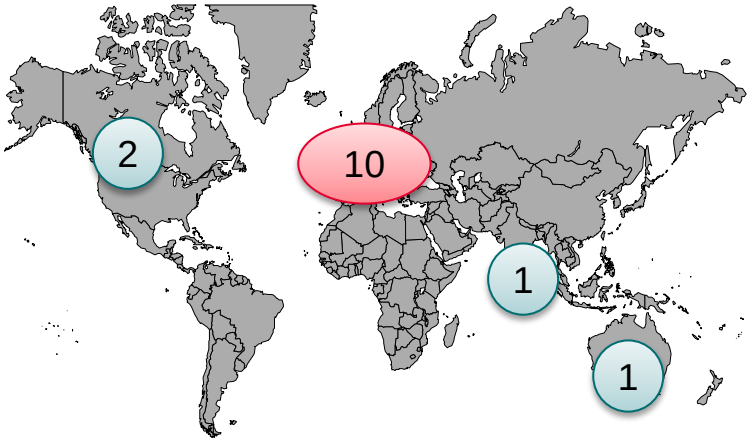
- Access to separately collected, homogeneous materials with a positive market value and a collection rate of 80%.
- Cost savings through reduced dispersion
- Access to data on the life cycle of products
- Dynamic incentive for actual recyclable product design through individual producer responsibility

Characteristics of the analyzed blockchain networks

Number of identified and analyzed blockchain networks:

14 Geographical coverage:

- mainly: global (9)
- Rest: transnational/two countries (1), national (3) and regional (1)].



Status:

- only 2 are fully functional
- Rest: development phase (7), pilot projects under way (4), early operational phase (1)].

Materials considered:

- Plastic waste (4),
- Various types of waste/old products (including plastics) (8),
- Other (2) [Food and its supply chain (1); exchange platform for different types of products and services (1)].

Overview of the five types of business ideas

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1 **C2B**
Bonus systems for collectors [9]
Recreum || Plastic Bank (IBM) || Agora Tech Lab || Empower || RecycleToCoin || Cycled ||Swachhcoin || Naturecoin || Troventum.bonus system

2 **B2C**
Complete life cycle documentation of the products [2]
Foodchain || Circularise || Excess Material Exchange

3 **B2B**
Rationalisation and automation the transport of waste [1]
Projekt "European waste transportation on blockchain"

4 **B2B**
Exchange of surplus Materials and Products + Matchmaking [1]
Excess Materials Exchange

5 **C2C**
Sharing products (private sector) [1]
ShareRing

types of business ideas to Blockchain and (plastic) waste prevention or recycling

InterReg Di-Plast 2019-2022

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Di-Plast aims to increase the use of recycled plastic by providing a more stable supply and quality of recycled material:

- Sensors generate data within the supply chains,
- Data Analytics provides information about quality and availability,
- Value Stream Management improves processes and logistics,
- Environmental assessments validate sustainability.

➢ 4 pilots enable 12 companies to increase the use of recyclate by 4 Kt.

➢ Uptake Manager (UM) enable 90 companies to introduce technologies, understand the benefits of recycling and achieve an 18Kt increase

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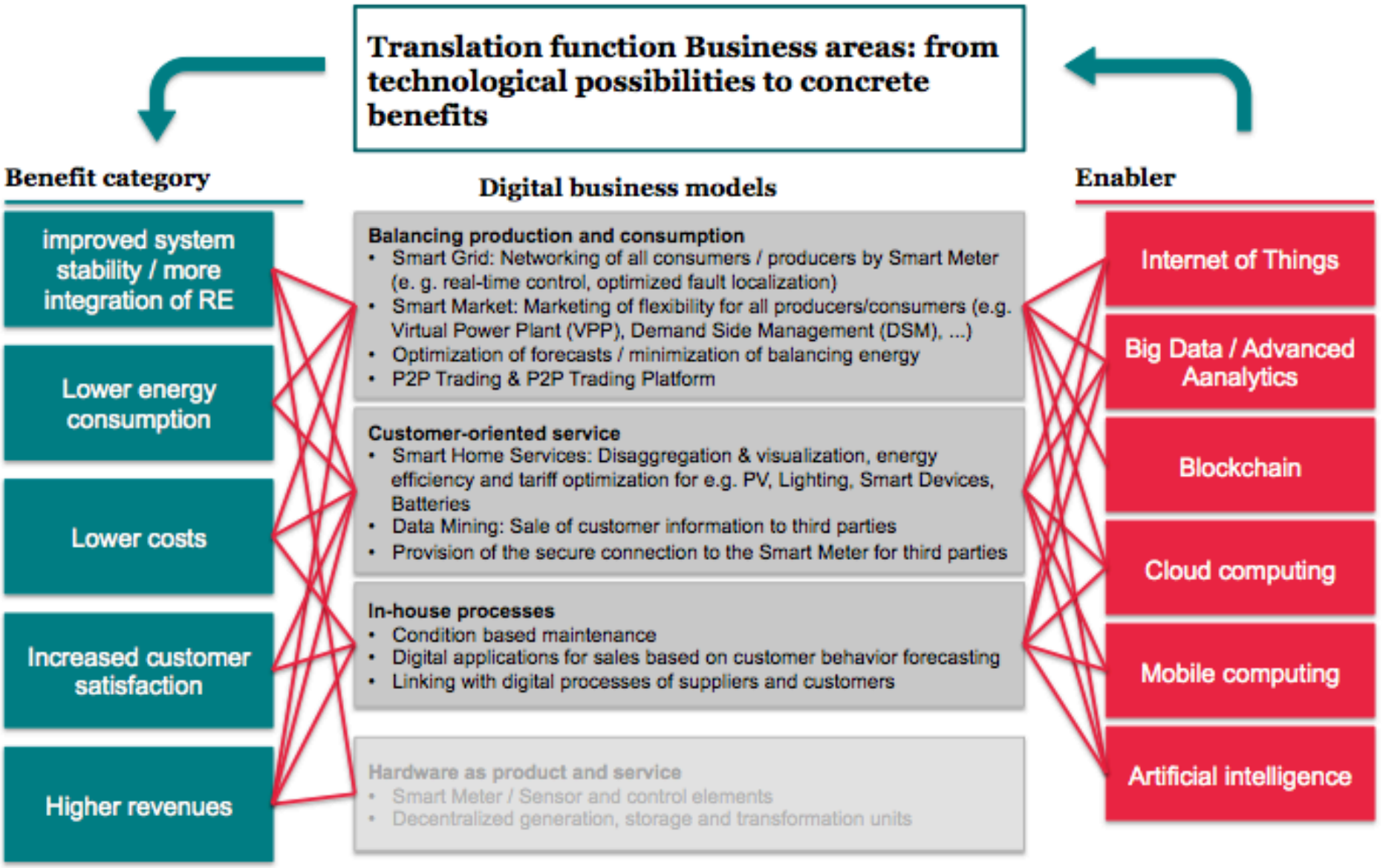
From technology to real benefit



Source: Weigel, Fischedick, 2018 (Customized and translated)

Digitalization is also not an end in itself!

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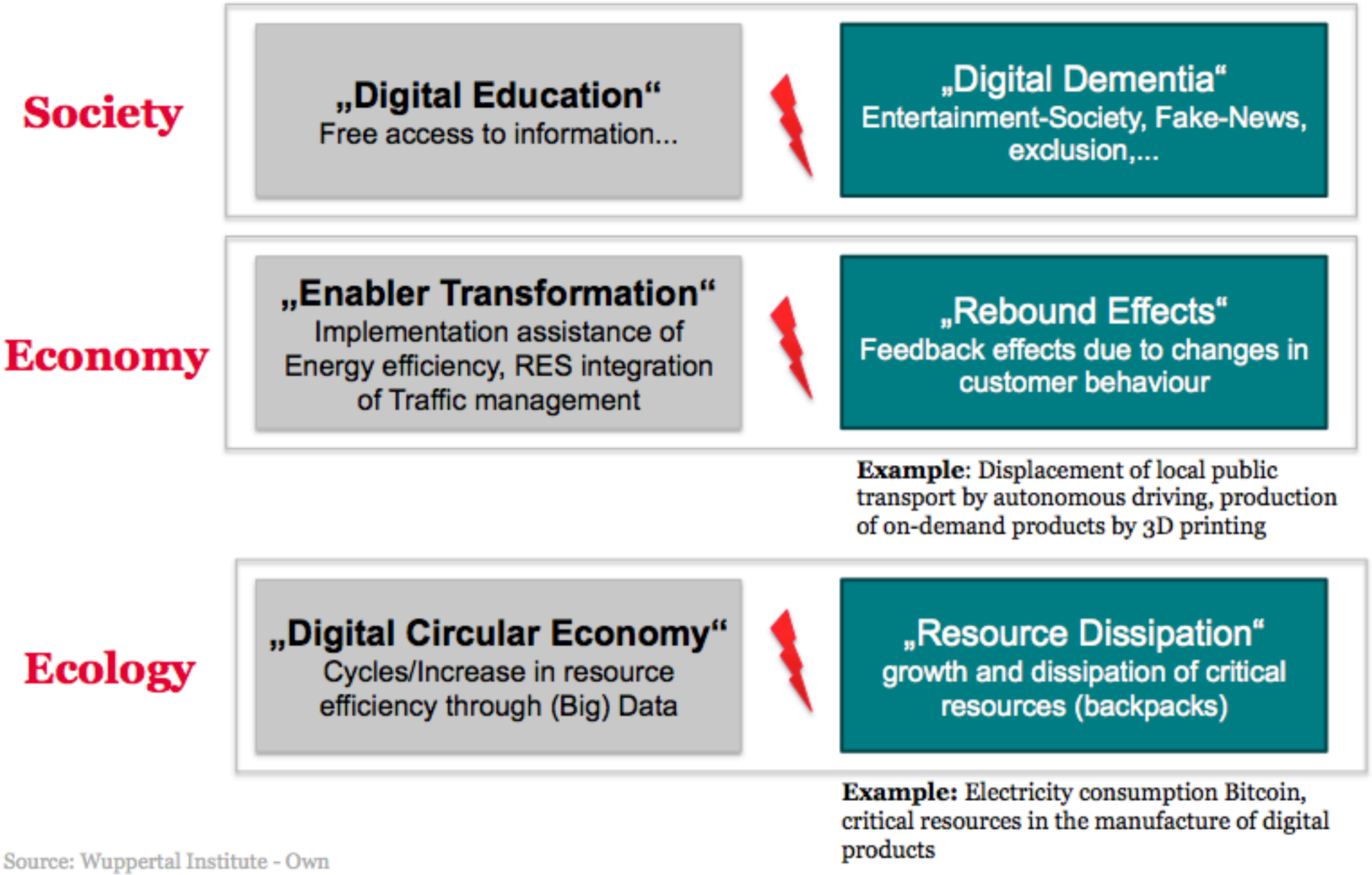

Source: Wuppertal Institute - Own

Thank you very much for your attention!

Dr. Henning Wilts

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