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20 JAHRE

Das Expertennetzwerk

Digital Transformation & Transformation for Sustainability

Ina Schieferdecker

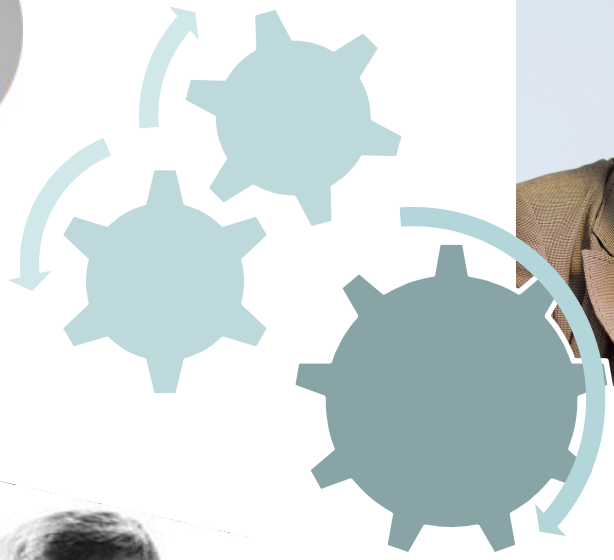
CUJAE – ASQF Meeting, May 26, 2017

The ASQF Board










„Software is not stand-alone – it became a critical part of society. We need to find approaches on how the digital and physical world can be co-evolve in the interest of sustainability.“

Via Della Conciliazione, Rom

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2005

2013

Business @ the Speed of Thought

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In Pearson Education Limited 2008

- The Internet has changed everything.

→ The Internet is going to change everything.

→ A network of networks is going to change everything.

→ A network of specialized, software-defined networks is going to change everything.

One Example: Industrie 4.0

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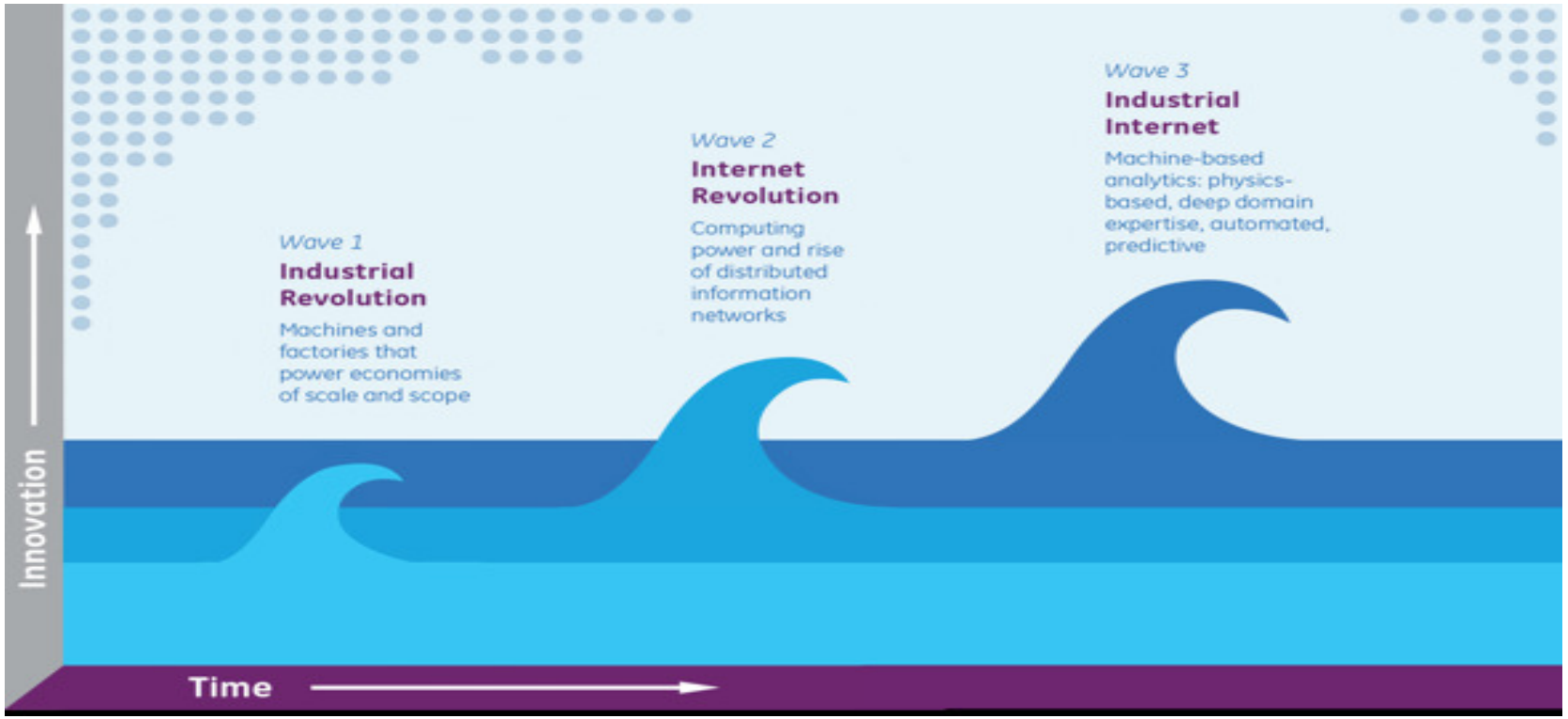
- Industrial Internet - A European Perspective, Pushing the Boundaries of Minds and Machines. GE, June 2013



http://www.ge.com/europe/downloads/industrialInternet_AEuropeanPerspective.pdf

One Example: Industrie 4.0

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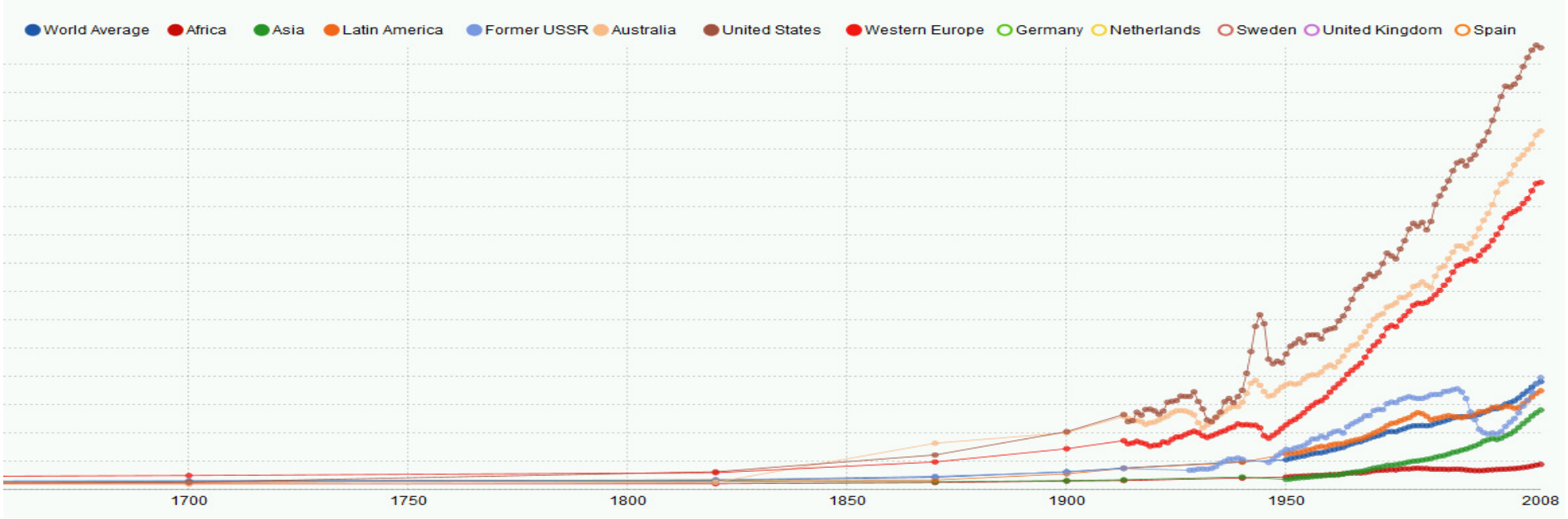
Real GDP per capita around the world,
Max Roser, Our World in Data



Real GDP per capita around the world,
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Short History of Networks

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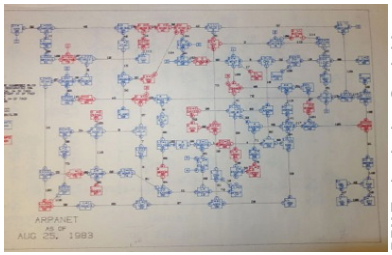
- Analog networks: 1st phone call 1877 in Germany
- Computer: Z3 by Konrad Zuse, 1941
- Digital networks: Arpanet, UCLA with “lo”,
  29. Oktober 1969
- Connected information: Web with hypertext by
  Tim Berners-Lee, 1989



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- Digital networks: Arpanet, UCLA with “lo”, 29. Oktober 1969
- **Connected Computation: Symposium on Principles of Distributed Computing, 1982**
- Connected information: Web with hypertext by Tim Berners-Lee, 1989

© UCL, Institute of Archaeology; first computer network

Digitization today

"Alles, was vernetzt werden kann,
wird auch vernetzt werden.“

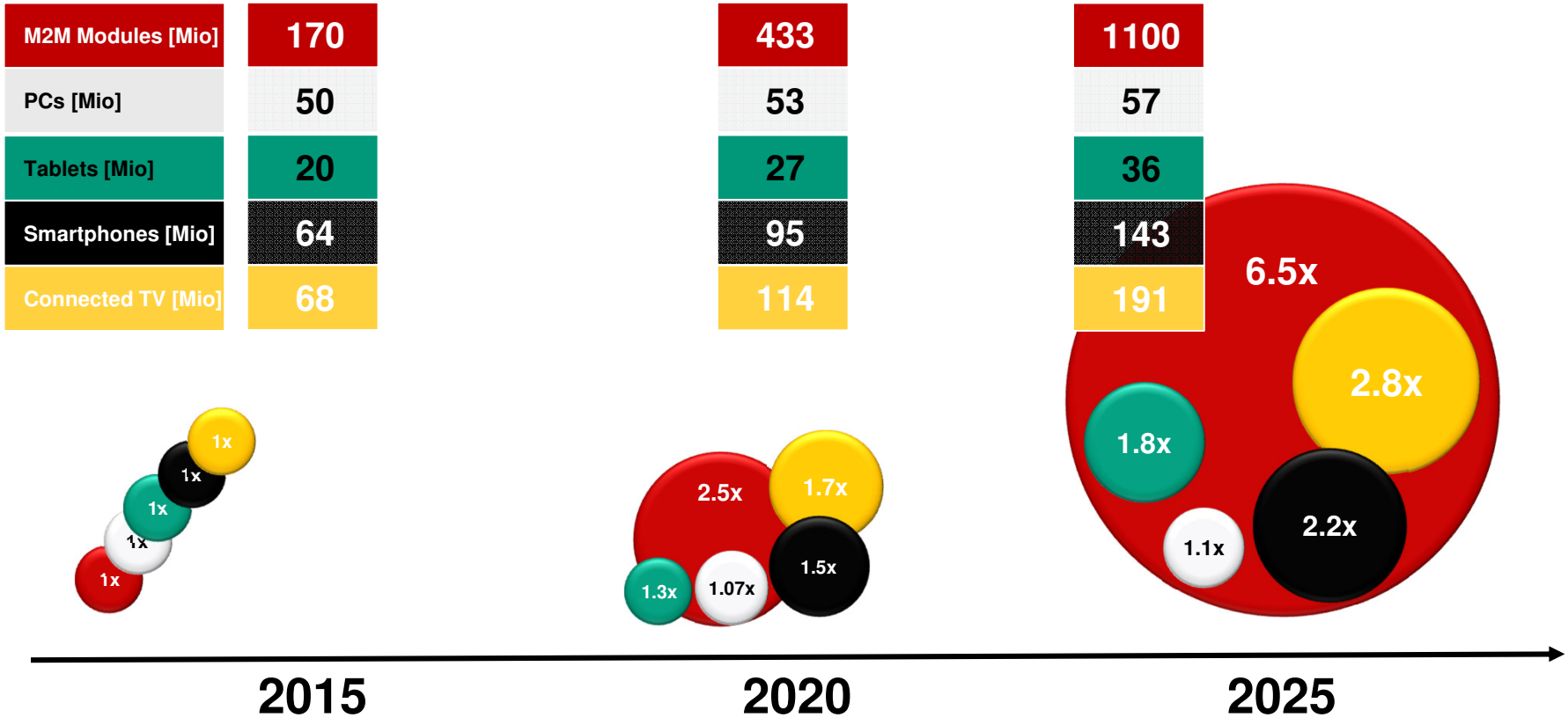
„Angela Merkel (Tobias Koch)“ von Tobias Koch - OTRS. Lizenziert unter CC BY-SA 3.0 de über Wikimedia Commons

→ Everything that can be digitally connected, will be digitally connected.

→ Examples include Internet of Things, Kognitive Machines and Artificial Intelligence, Additive Manufacturing, Smart Cities, Industrie 4.0, Smart Grids, Blockchains, and others

Internet of Things (IoT) sensors and devices are expected to exceed mobile phones as the largest category of connected devices in 2018, growing at a 23% compound annual growth rate (CAGR) from 2015 to 2021. Source: Ericsson

Technical challenges
Exponential growth, e.g. in Germany



Source: 2020: Cisco Visual Networking Index, 2025: same growth

Landscape of the Internet of Things

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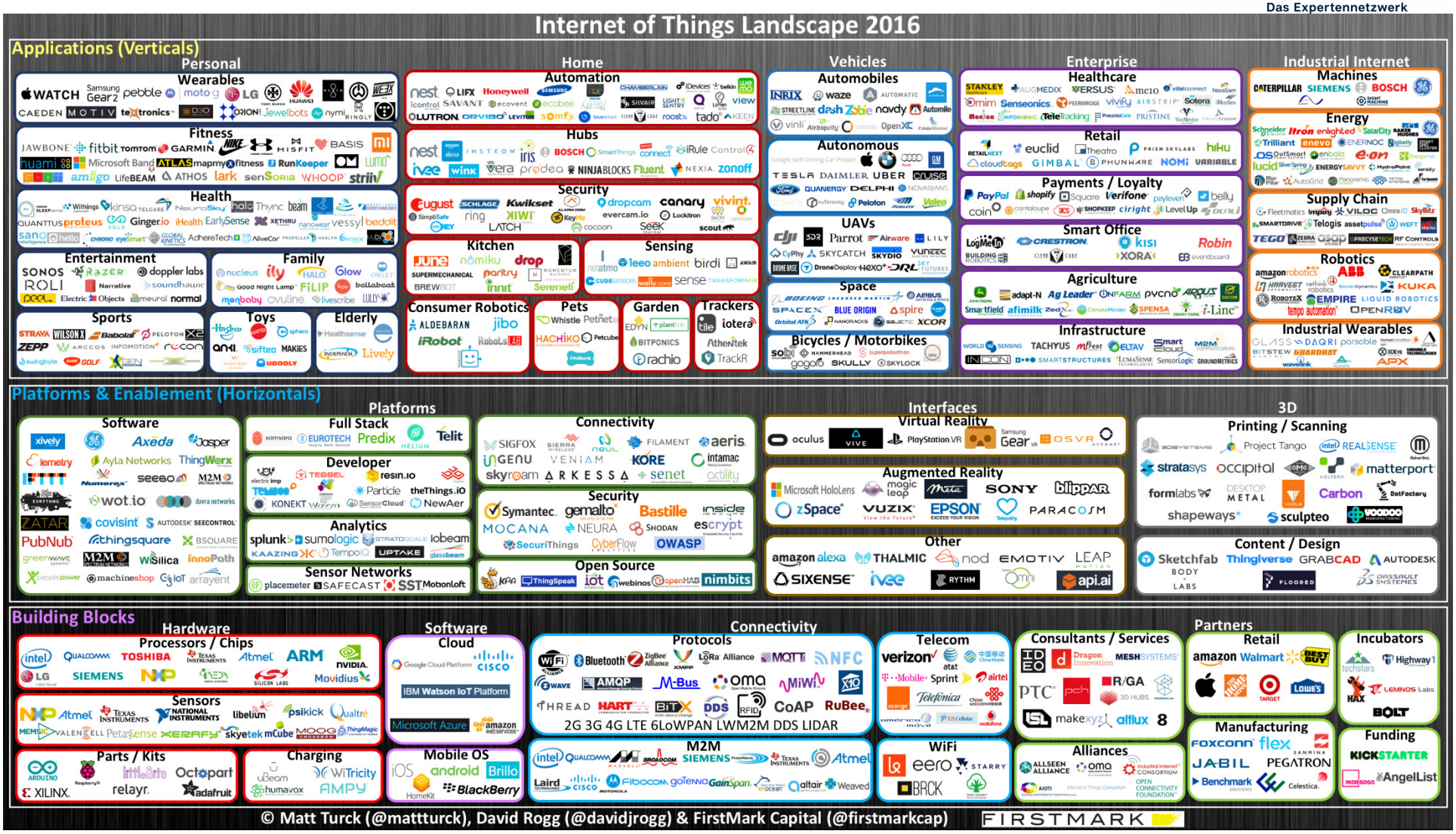

Source: http://mattturck.com/wp-content/uploads/2016/03/Internet-of-Things-2016.png

Societal challenges

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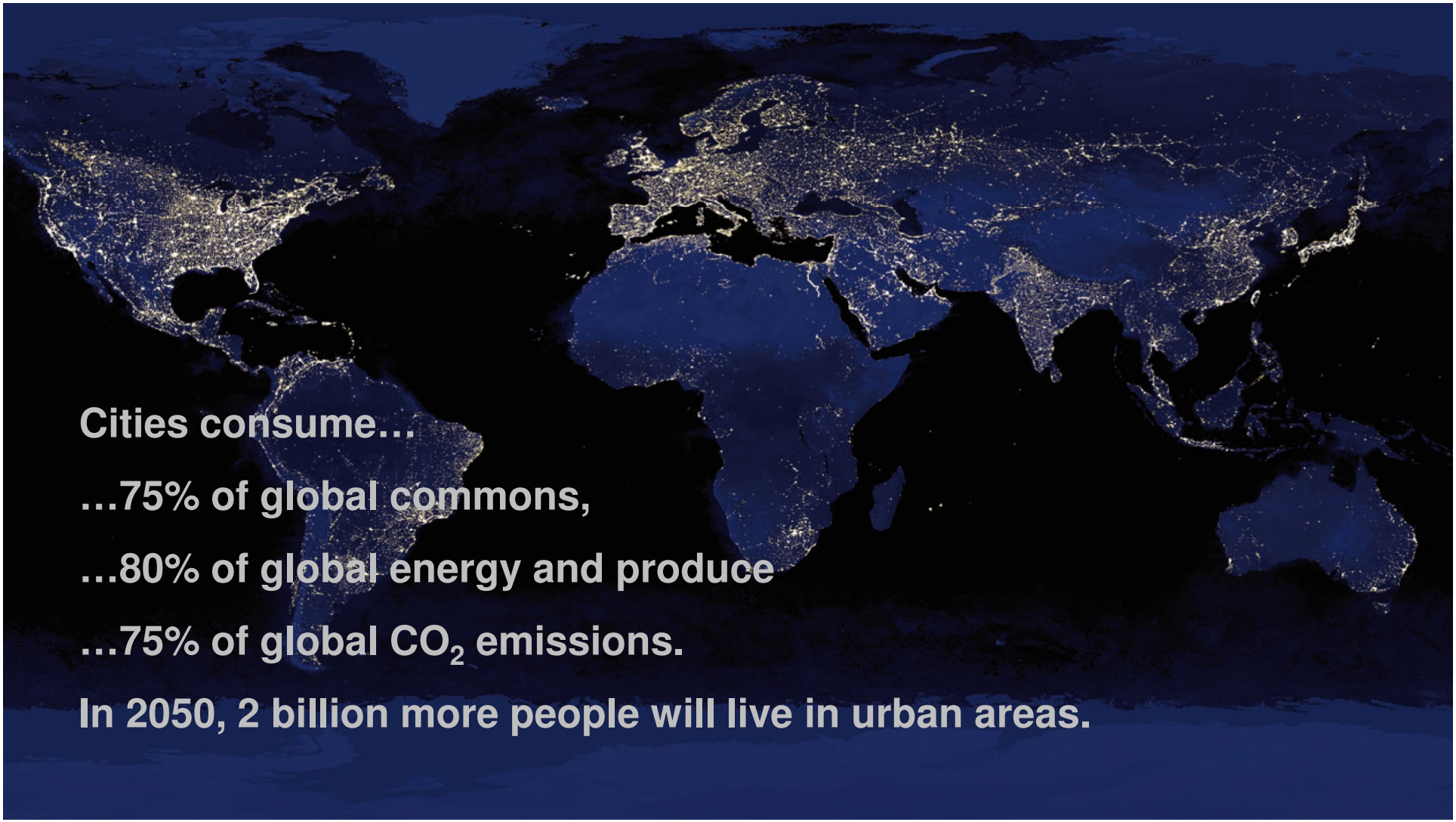
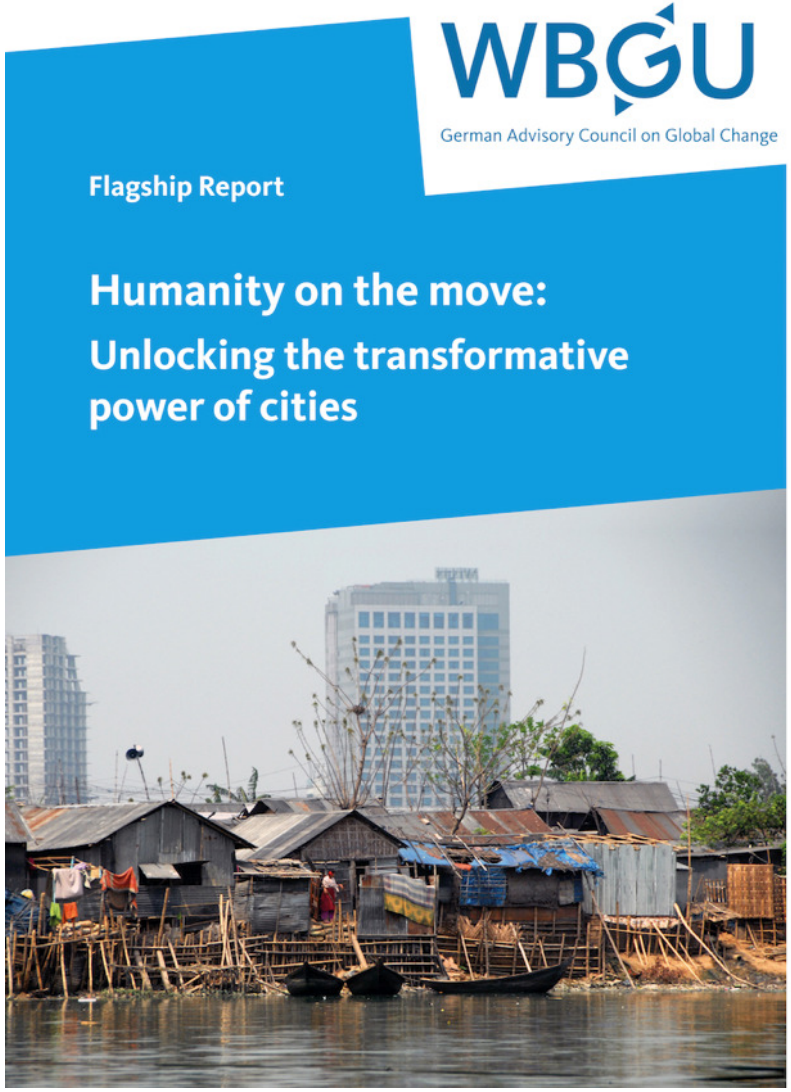
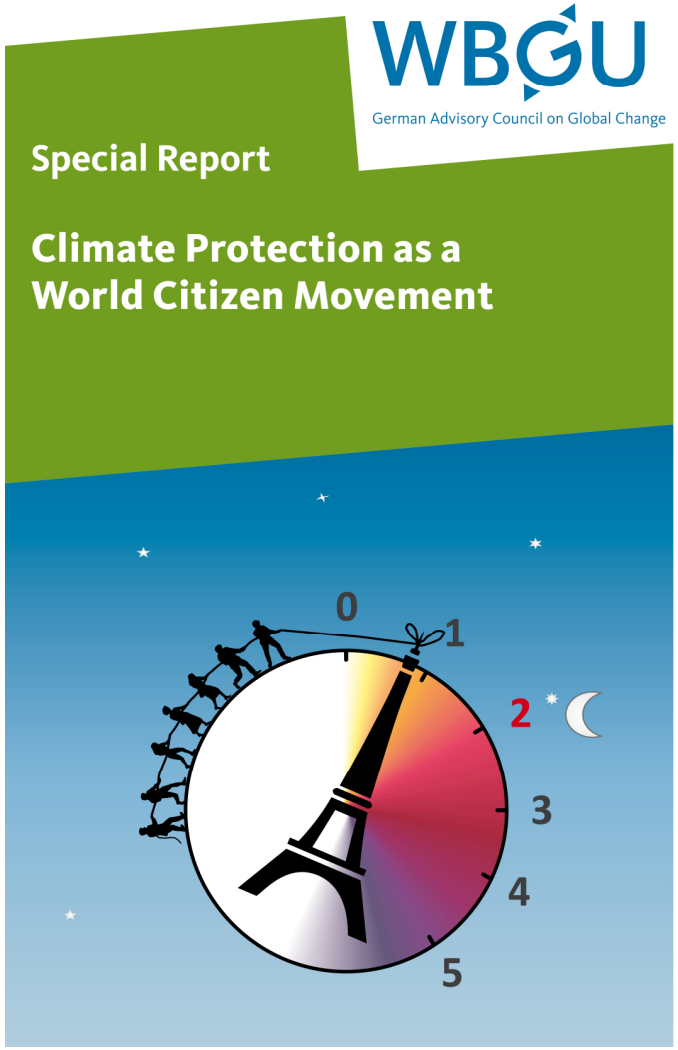




2016:

WBGU report on urbanization submitted to the German Government

Input for Habitat III



2013:

Knowledge on anthropogenic climate change

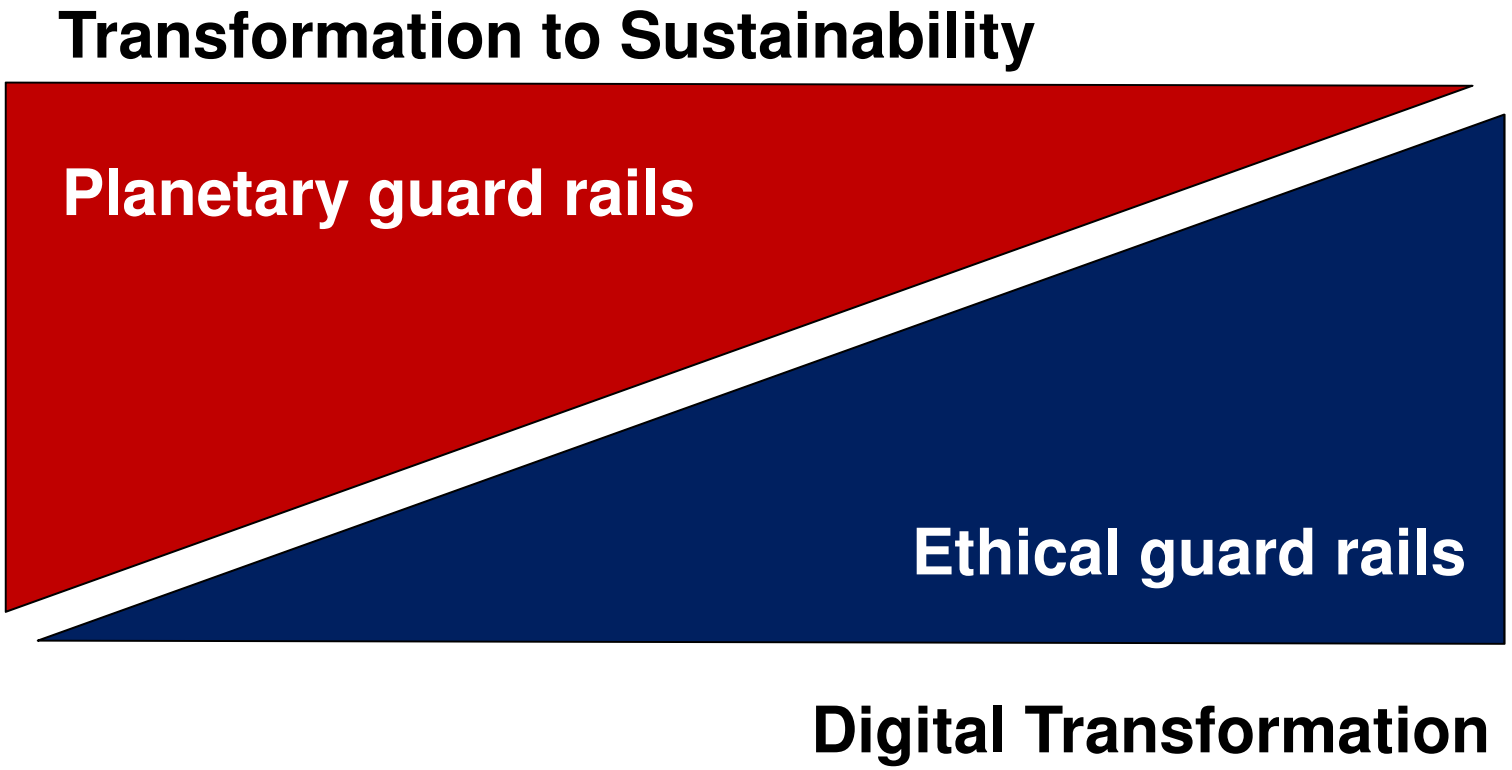
Challenges for equitable climate protection

Proposal for a Paris Climate Protocol in 2015

Zero-emissions target and responsibility

- The zero-emissions target requires both individual people and the community to take on responsibility
- Regardless of a global agreement, it is the responsibility of all countries to initiate and implement a transition to a CO_2-emissions-free economy
- Given their large contribution to the causes of climate change, the high-emission countries have a responsibility to support the low-emission countries in their transformation

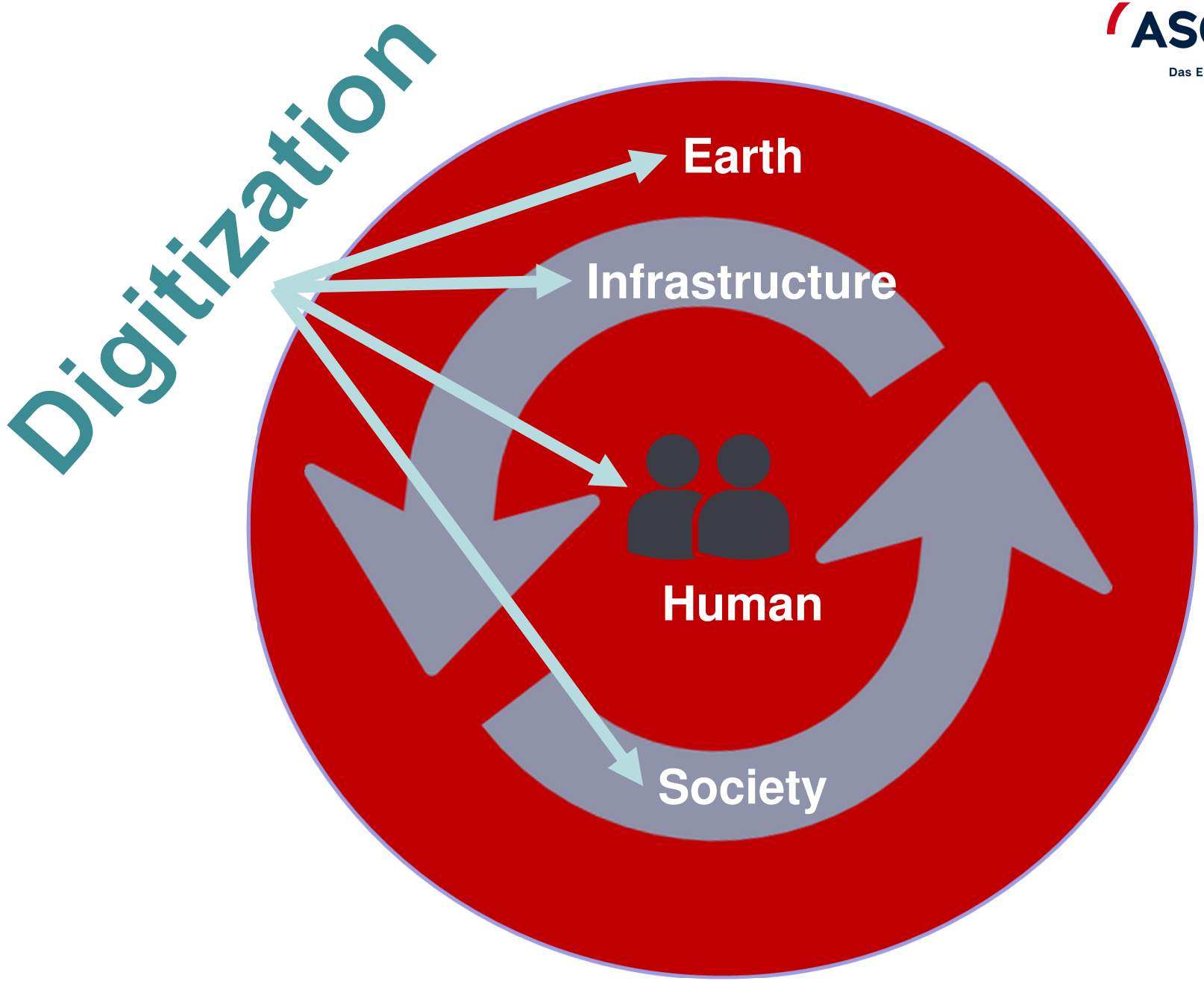
Co-Evolution of Digitization and Sustainability



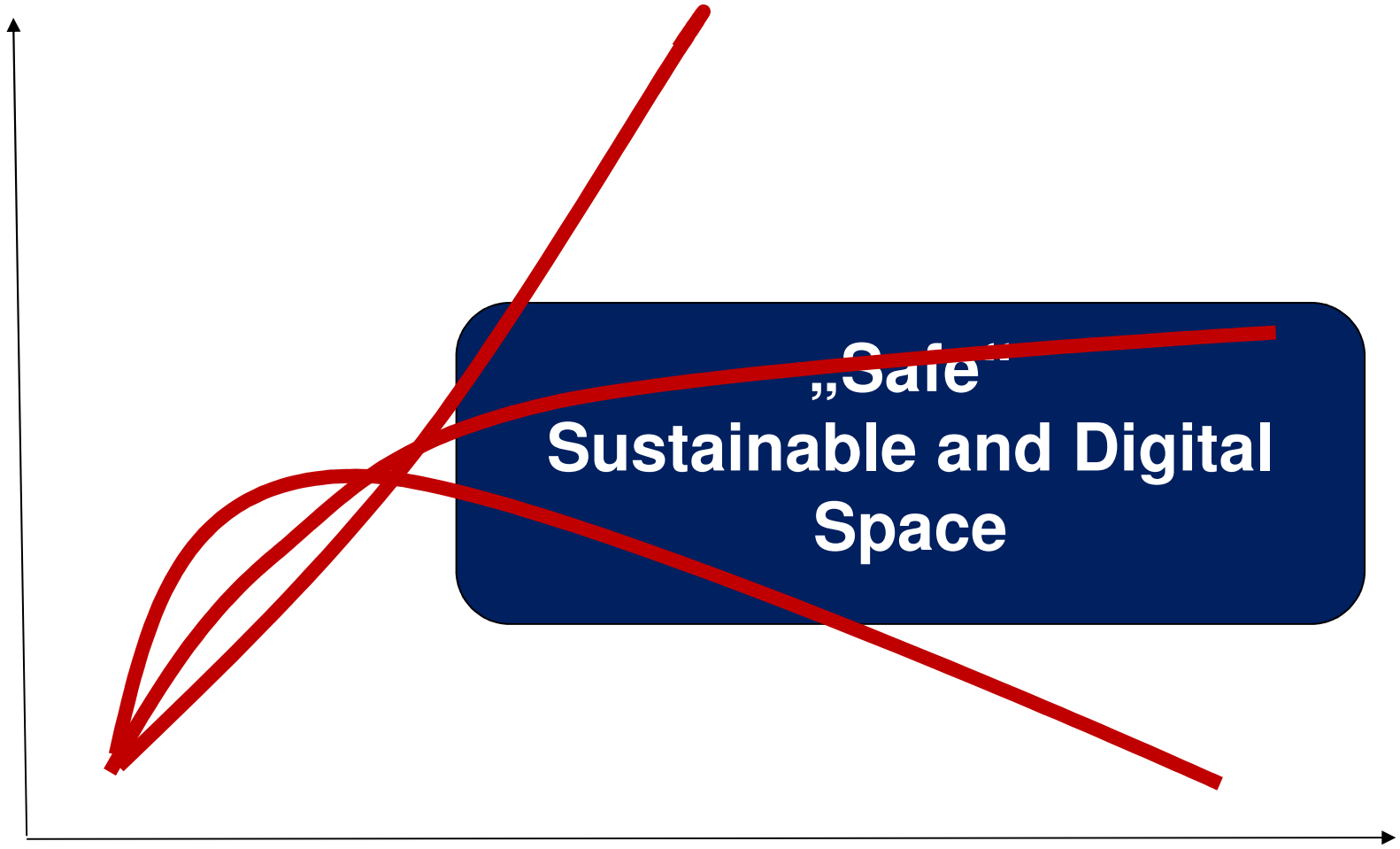
Digitization has the needed power to reach the SDGs in 2030, however it bears also a number of own risks

Selected Observations on Digitization

1. Unclear usage of data
2. Privacy and data protection are at risk
3. Data is commercially placed as currency
4. Data in the interest of the global public is commercialized
5. Digital identities and sovereinity are not regulated
6. …


Digitization
Earth
Infrastructure
Human
Society

Options on Digitization



Draft Goals on Digitization

1. Sustainability to become a central performance indicator of digital solutions
2. Preserving global digital commons
3. Ensure digital inclusion
4. Ensure data protection
5. Ensure IT security
6. …

Selected initiatives in Berlin and Germany

- WBGU Study on Digitization and Sustainability (financed by the ministry of research and the ministry of environment)
  → being published in 2018

- German Research Center for Internet and Society (financed by the ministry of research)
  → being established in Berlin

- Einstein Center on the Digital Future (public-private partnership)
  → 50 new IT professors at universities of Berlin

- Fraunhofer Center on Digital Transformation (public-private partnership)
  → Applied research projects on IoT, smart cities, Industrie 4.0

- ASQF and iSQI go digital and sustainable

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