WBGU Flagship Report:
Towards our Common Digital Future

e-IRG Workshop,
2. December 2020

Martina Fromhold-Eisebith
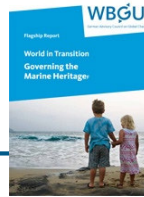WBGU member 2016-2020 and Professor
of Economic Geography, RWTH Aachen University

WBGU as science-society-policy-interface

Independent scientific policy advice

- **9 professors**: interdisciplinary, appointed for 4 years, scientific staff
- **Secretariat** with scientific core team

SCIENCE

SOCIETY

POLICY

POLICY
National & Global

SCIENCE

SOCIETY

Fed. Government
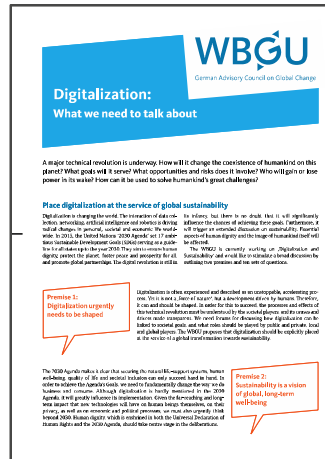BMU & BMBF
Interministerial
Committee

SUSTAINABLE
DEVELOPMENT
GOALS

Deutscher Bundestag

Set of publications on the topic

March 2018

April 2019

September 2019

Central issues

How can we employ digital technologies for achieving more sustainability?

How does digitalization transform societies and requirements towards sustainability?

What needs to be done?

Digitalization as a **Sustainability Topic**? Several perspectives matter
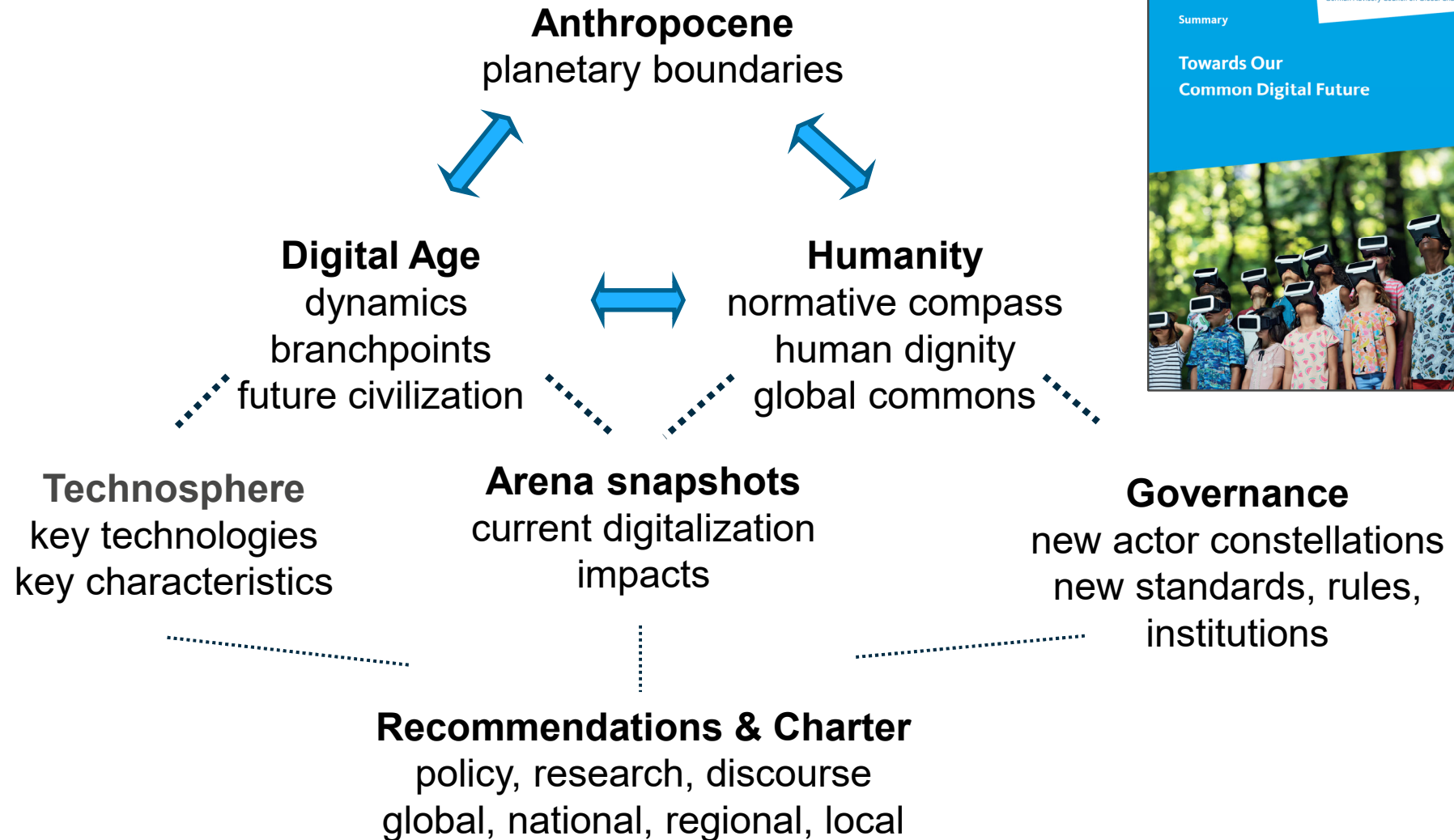
Sustainable Digital Infrastructures & Digital Tools for Sustainability

- **Energy** and mobility systems

- Materials and **resources** (circular economy, 'demateralization', rare earth metals)

- **Development** (poverty, agriculture, access & inclusion)

"Sustainable Digital Societies"

- Social **cohesion** (digital divides, (in)equality, gender bender, 'work of the future')

- **Power** imbalances and abuse (big five, authoritarianism, individual exposure)

- **Democracy** (public discourse, privacy, accountability)

Logical structure of the report

Anthropocene
planetary boundaries

Digital Age
dynamics
branchpoints
future civilization

Humanity
normative compass
human dignity
global commons

Technosphere
key technologies
key characteristics

Arena snapshots
current digitalization
impacts

Governance
new actor constellations
new standards, rules,
institutions

Recommendations & Charter
policy, research, discourse
global, national, regional, local

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German Advisory Council on Global Change

Summary

**Towards Our
Common Digital Future**

Understanding the Digital Age

Key technologies
- Internet of Things
- Big data
- Artificial intelligence
- Cybersecurity
- Monitoring
- Augmented and virtual realities
- Robotics
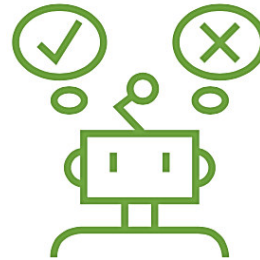- 3D printing
- Blockchain
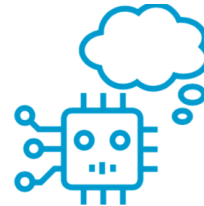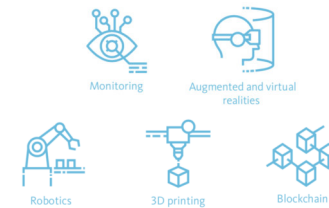
Characteristics
- Interconnectedness
- Cognition
- Autonomy
- Virtuality
- Knowledge explosion

Spheres of life
- Earth system
- Economy
- Society
- People
- Technology

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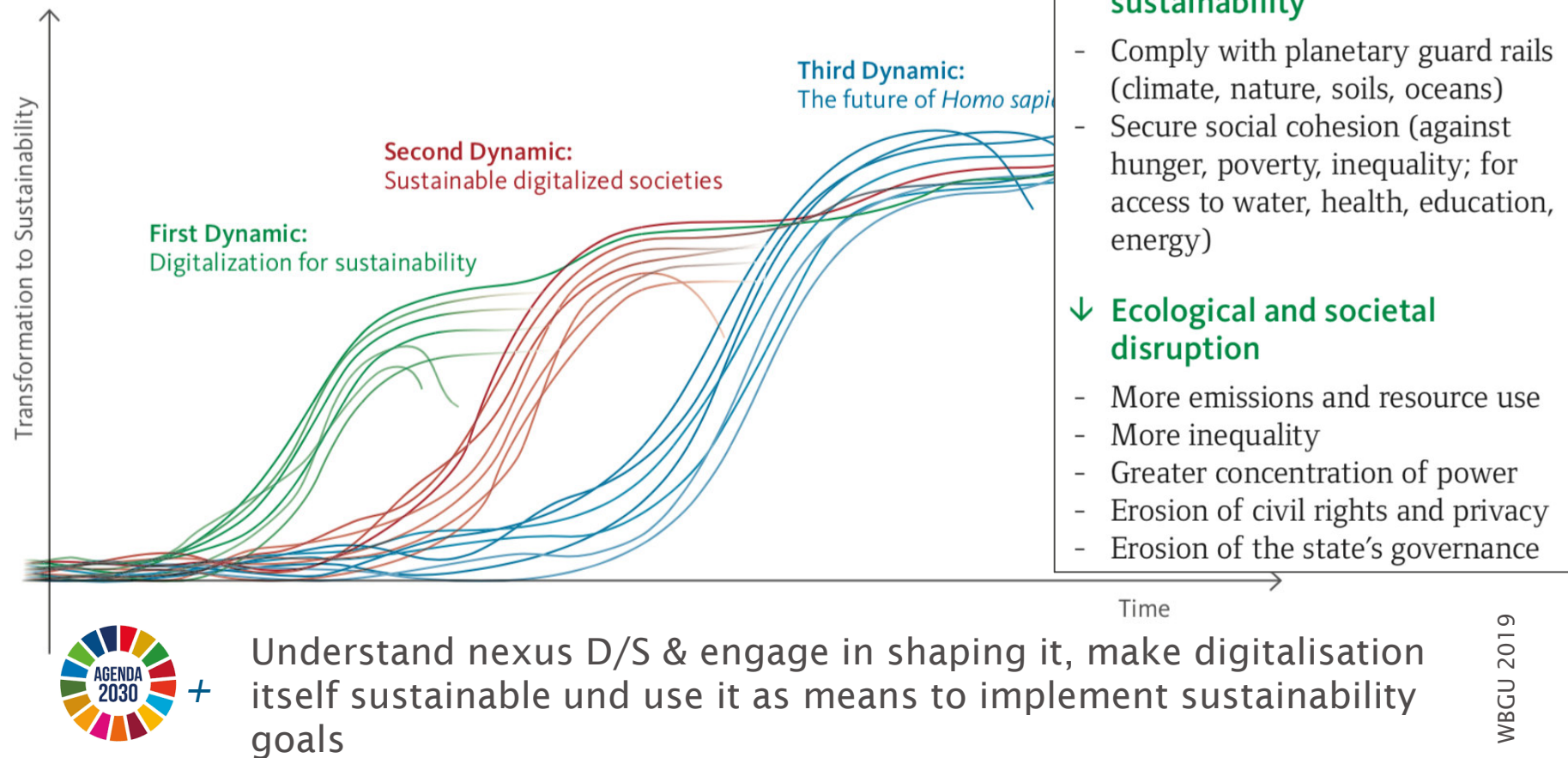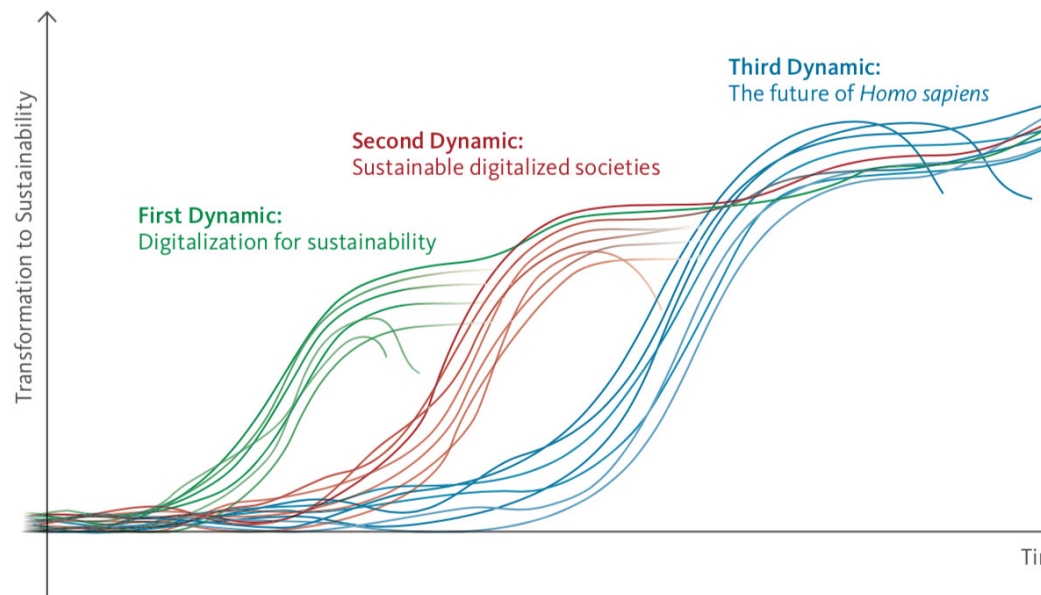# "Guidance" – **Three Dynamics** of the Digital Age...

> synthesis of the interrelations between digital change and transformation to sustainability.

> to derive various acute **needs for action NOW!**

First Dynamic:
Digitalization for sustainability

Second Dynamic:
Sustainable digitalized societies

Third Dynamic:
The future of *Homo sapi...*

Transformation to Sustainability

Time

↑ **Digitally support sustainability**

- Comply with planetary guard rails (climate, nature, soils, oceans)
- Secure social cohesion (against hunger, poverty, inequality; for access to water, health, education, energy)

↓ **Ecological and societal disruption**

- More emissions and resource use
- More inequality
- Greater concentration of power
- Erosion of civil rights and privacy
- Erosion of the state's governance

AGENDA 2030 + Understand nexus D/S & engage in shaping it, make digitalisation itself sustainable und use it as means to implement sustainability goals

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"Guidance" – **Three Dynamics** of the Digital Age...

First Dynamic:
Digitalization for sustainability

Second Dynamic:
Sustainable digitalized societies

Third Dynamic:
The future of *Homo sapiens*

Transformation to Sustainability

Time

↑ **New humanism**

- Networked world society as a further advancement of Enlightenment and humanism
- Development of global (environmental) awareness
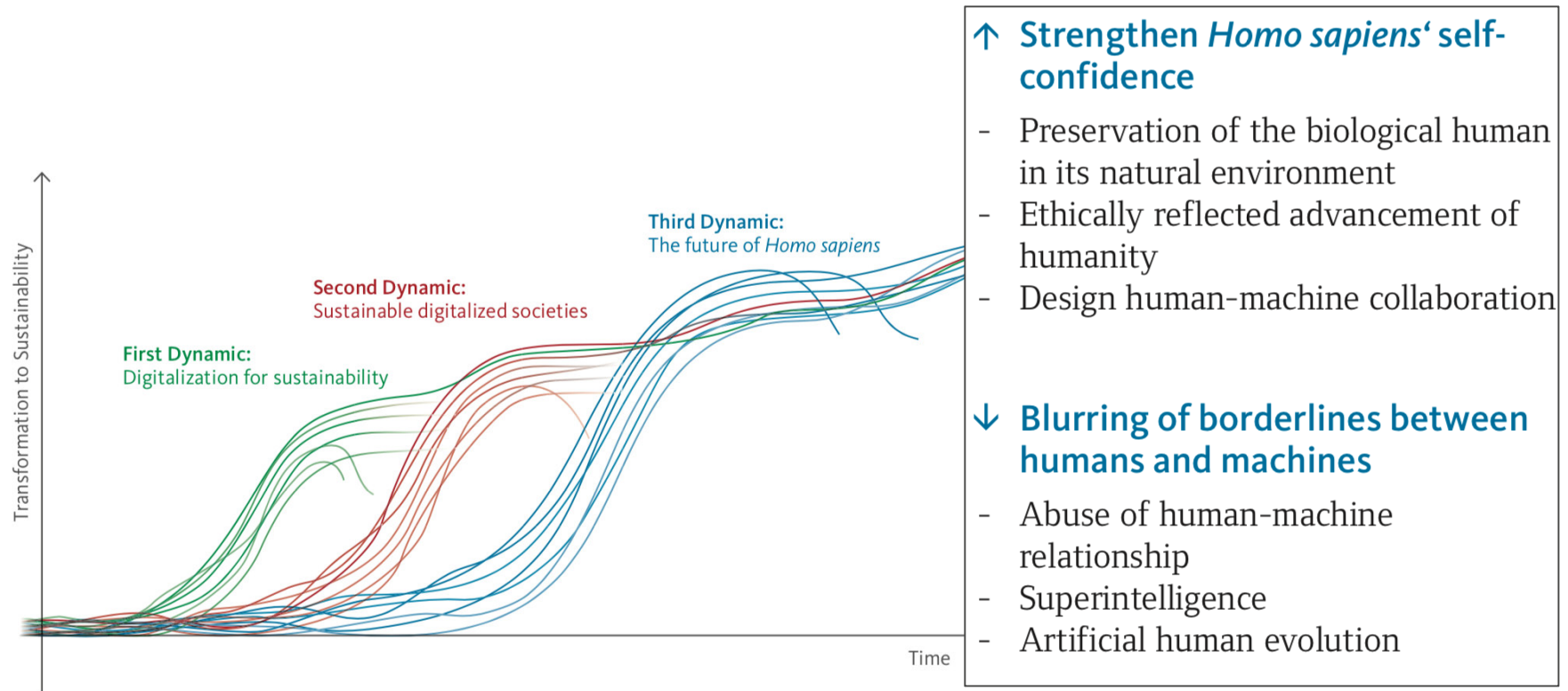- Culture of cooperation, empathy, global solidarity

↓ **Digitally empowered totalitarianism**

- Hollowed-out democracies and digitally empowered autocracies
- Massive inequality, domination by elites, total surveillance and loss of freedom
- Environmental destruction and loss of social cohesion

Societal ,Update', anticipatory risk assessments & governance, but also overarching visions and specific goals for "sustainable digitized (world) societies"

AGENDA ?

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"Guidance" – **Three Dynamics** of the Digital Age...

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Transformation to Sustainability (y-axis), Time (x-axis)

Third Dynamic: The future of *Homo sapiens*

Second Dynamic: Sustainable digitalized societies

First Dynamic: Digitalization for sustainability

↑ **Strengthen *Homo sapiens'* self-confidence**

- Preservation of the biological human in its natural environment
- Ethically reflected advancement of humanity
- Design human-machine collaboration

↓ **Blurring of borderlines between humans and machines**

- Abuse of human-machine relationship
- Superintelligence
- Artificial human evolution

Society-wide discourse on desirable futures, research, education and ethics around homo digitalis, machina sapiens, natura futuris

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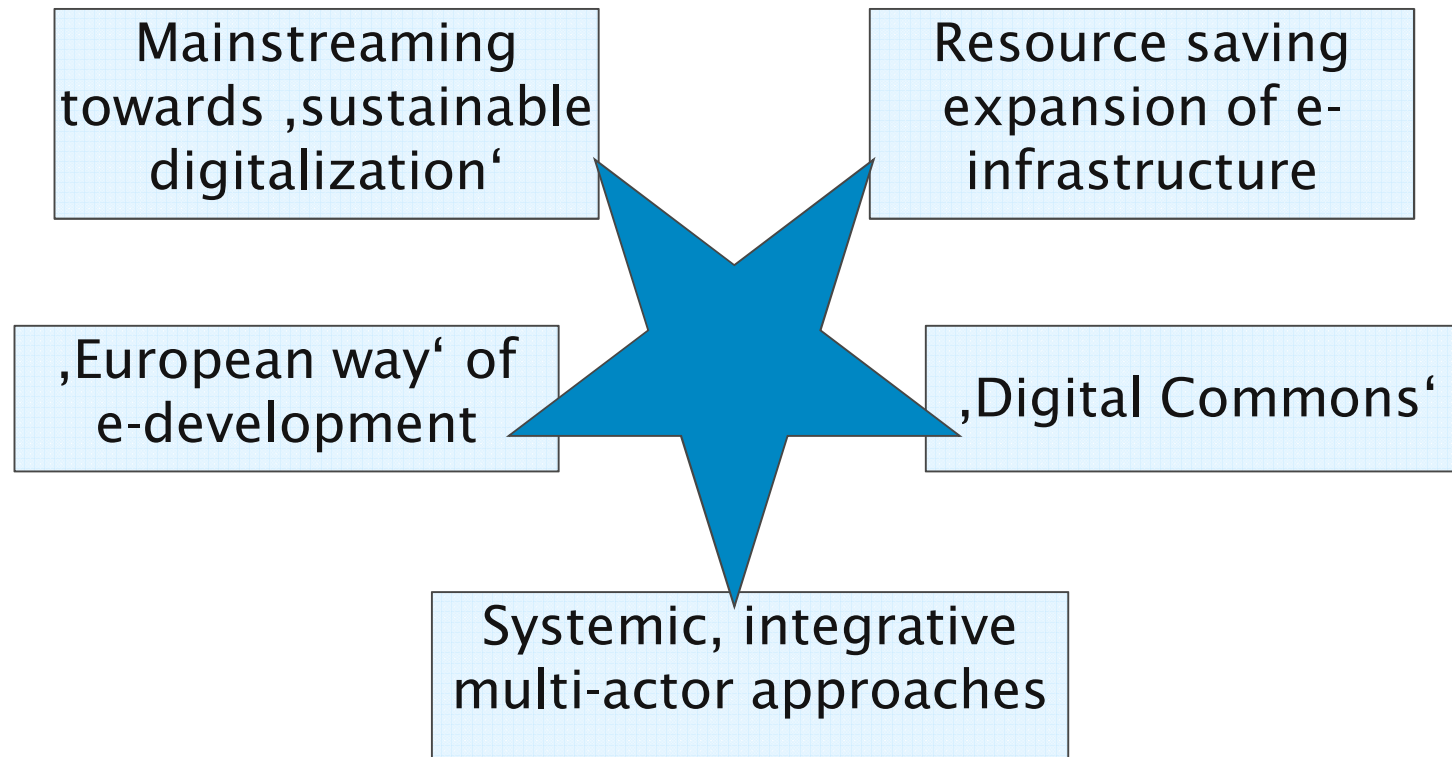# "Deepdives" – **Arenas** of Digital Change
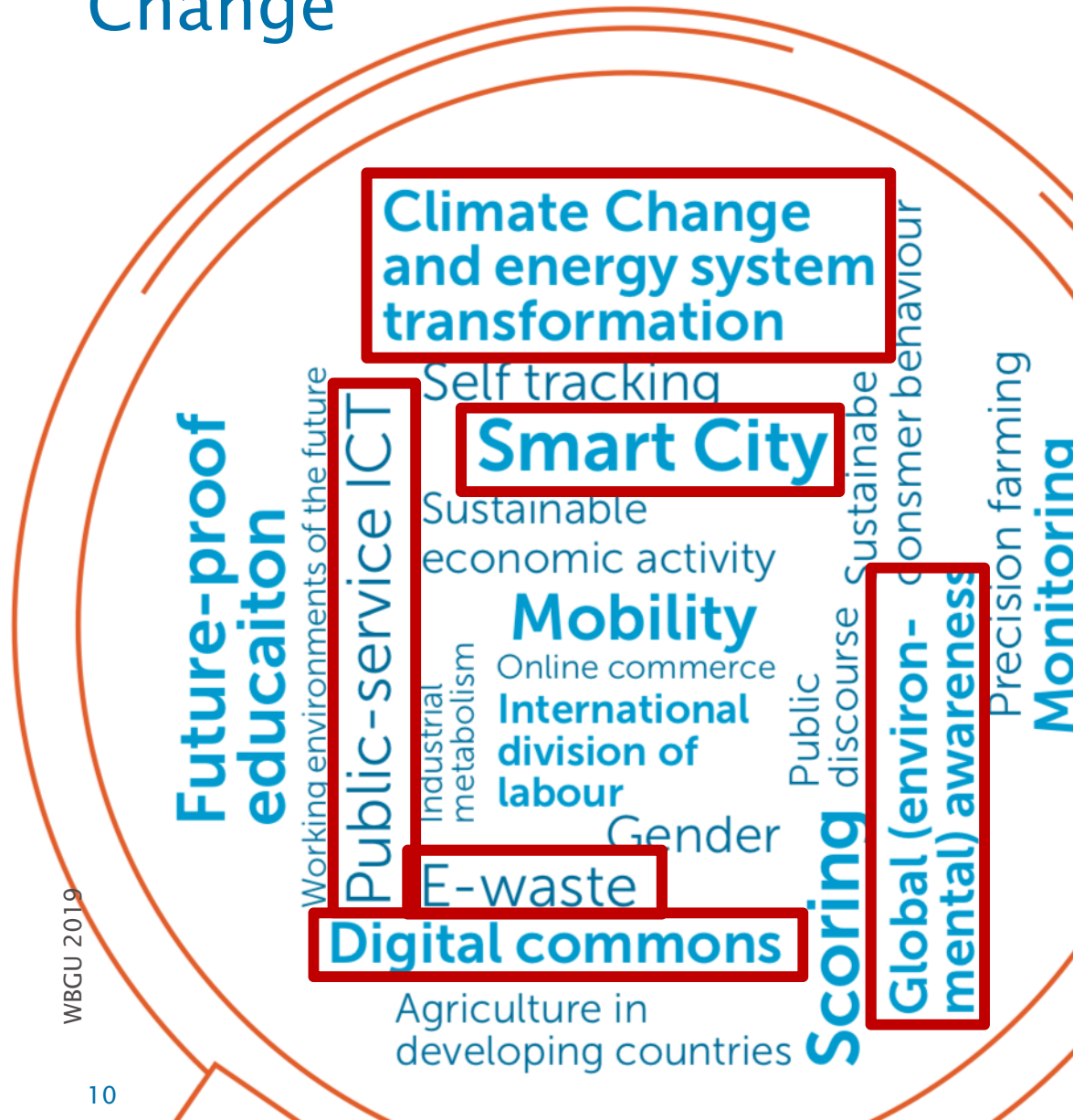
Most relevant for e-infrastructure

- **Public service ICT**
- **E-waste and circular economy**
- **Smart City**
- **Climate change and energy system transformation**
- **Global awareness**
- **Digital commons**

Cornerstones for a **sustainability oriented e-infrastructure strategy** in the EU

Mainstreaming towards ‚sustainable digitalization'

Resource saving expansion of e-infrastructure

‚European way' of e-development

‚Digital Commons'

Systemic, integrative multi-actor approaches

Resource saving expansion of e-infrastructure

- ➢ Always bear in mind issues of resource efficiency when building up e-infrastructure!
- ➢ Primate objectives of e-waste reduction, reuse and recycle of IT components
- ➢ Foster and use component designs that support circular economy uses
- ➢ Develop and establish IT enhanced systems for monitoring the resource inputs to e-infrastructure, and for better coordinating e-wast management and circular economy

‚European way' of e-development

➢ Create a characteristic, value based alternative both to
  – the USAmerican way (primarily market-controlled, profit maximizing behaviour)
  – and the Chinese way (use of digital instruments for exercising authoritarian state power)

➢ Foster the formation and growth of a corporate 'European IT giant' for hardware and/or software provision, Internet services incl. E-commerce etc. (to set something against powerful USAmerican and Chinese industrial players)

➢ Important element: 'Digital commons' (next slide)

‚Digital Commons'

➢ Acknowledge and support essential citizens' rights in the digital age:

  – More emphasis on functional digital public services and related infrastructures

  – Access as a basic human right: 'Free Internet for All'; open data availability

  – Improve data security and control for individuals, joining forces with companies

➢ Establish sustainability-oriented artificial intelligence (AI) applications that improve lives on a broader scale

Systemic, integrative multi-actor approaches

➢ Acknowledge the systemic nature of e-infrastructure tasks: Establishing digital hardware and tools requires action also towards human qualification and the proactive involvement of citizens

➢ A major 'qualification offensive' towards sustainability oriented digitalization should systematically integrate schools, universities, as well as private and public enterprises

➢ Encourage 'test space' use for (less regulated) local-regional experiments, 'Living Labs' for gradually building up systemic IT based hard- & software solutions (e.g. Smart Cities)

Main action fields for the EU 'at a glance'

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Policy Paper

A European Way to our Common Digital Future

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Integrate the opportunities and risks of digitalization into EU sustainability policy

Involve the private sector more in the provision of data

Actively shape digital policy in line with sustainability goals

Develop and apply artificial intelligence in a sustainable way

Gear EU research policy and promotion of innovations consistently towards sustainability goals

Ensure access to digital commons and basic services through public-service information and communication technology (ICT) infrastructures

European digitalization model as a priority in foreign policy

Call for "Agency" on various levels – **Transformative Actors** in the Digital Age

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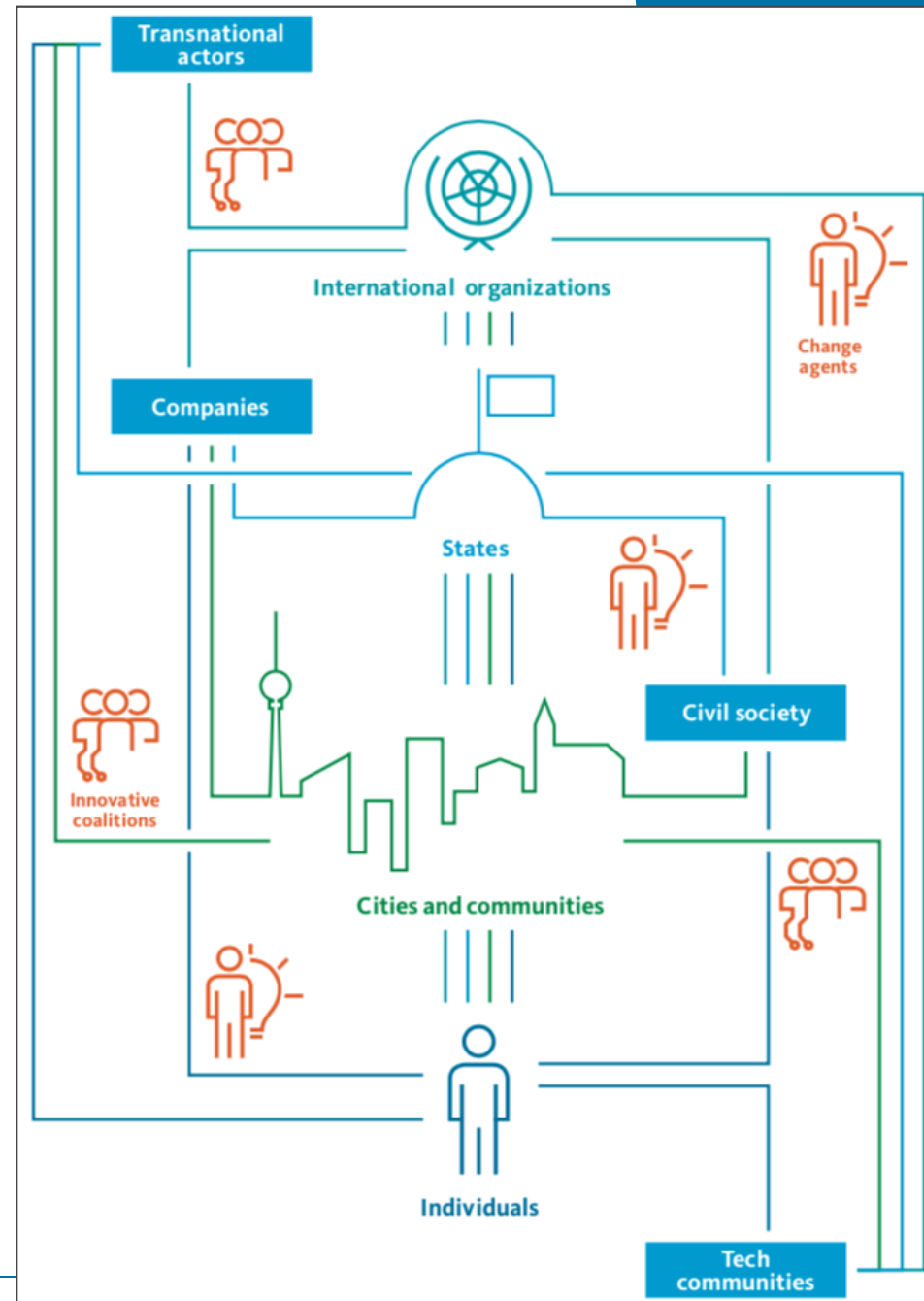
Finally:
Some broader **points for action**
(selection)

- **Digitally enhanced monitoring** of SDG-indicators, biodiversity etc. (incl. data protection), and publication of data as digital commons

- **WBGU-Charta** process and **UN-Summit** „Sustainability in the Digital Age " 2022 (→ Rio+30)

- Building blocks for **sustainably acting societies**
  - future oriented education & science
  - digital literacy & ‚Education for Sustainable Development'
  - spaces for experiments and discourse
  - prevention of power concentration
  - reducing ‚digital divides' ….

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Thank you for your attention

Please get in touch /// All publications freely available (print + digital) at **www.wbgu.de**

@WBGU_Council *#SustainableDigitalAge*

CAN DIGITALIZATION SAVE THE PLANET?
Where new digital technologies can improve sustainability

CODE_n