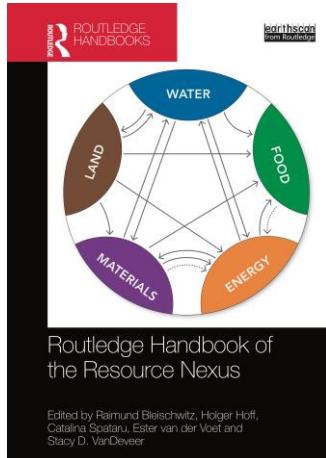


# European Resources Forum

**Plenary session I:**  
**The nexus between resource use and climate change –**  
**Making Europe more resource efficient and climate friendly**

*November 3, 2020*

**Prof. Dr. Raimund Bleischwitz**  
Chair in Sustainable Global Resources  
Director BSEER



## 1) The Resource Nexus: a necessary complement to climate action



- Addresses interlinkages; enables overcoming silo-thinking and avoiding traps of low carbon energy (biodiv losses, water risks, unwanted side-effects)
- Defined as the set of context-specific critical interlinkages between two or more natural resources used as inputs in socio-economic systems
- Involves a variety of actors in policy and planning: infrastructures, food industry, supply chain actors, development agencies, international organizations; all quite often operating in crisis regions and/or the Global South

## 2) The Nexus Supports Integration Across the SDGs



SUSTAINABLE  
DEVELOPMENT  
GOALS

### SDGs

- Goal 2 to „End hunger...“
- Goal 6 to „sustainable water and sanitation...“
- Goal 7 to „sustainable energy ...“
- Goal 9 to „infrastructure, industrialization (...)“
- Goal 11 sustainable cities

nature  
sustainability

PERSPECTIVE

<https://doi.org/10.1038/s41893-018-0173-2>

Resource nexus perspectives towards the United Nations Sustainable Development Goals

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### ...Nexus Implications

- (2)...increasing demand for land, **mineral fertilizers**, water, biomass and food
- (6)...investments in water supply and a water distribution infrastructure, i.e. increasing demand for **materials**
- (7)...increasing demand for bio-energy and renewable energy, which again implies more demand for land, biomass, water, and **materials**
- (11)...Will require more **construction materials, metals, and other materials**

### ...Nexus - Innovation enables

- the sustainable production and consumption agenda,
- Local and global increases and disruptive innovations in RE/CE
- achieving sustainable and resource-efficient infrastructures by 2030 (goal 9)
- Sustainable management and efficient use of all resources by 2030 (goal 12).

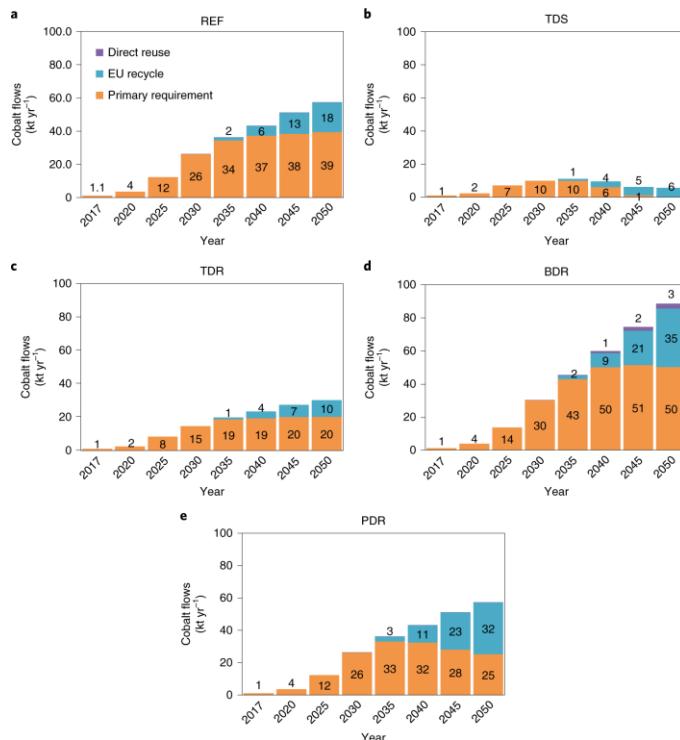
**Case:** Water-Energy nexus in Brazil – Drought spurs analysis of hydro-dams and planning. Water budget approach to address evaporation reveals criticality of North-East, need for more interconnected grids and solar-based REN (T. Semertzidis et al)

### 3) A nexus approach helps to transform the 'hard to abate' sectors

- ...of steel & other base metals, cement & other construction materials by addressing the nexus between materials, energy and water as well as circularity
- Case: macro-economics of shifting to scrap steel
  - China could gain up to cumulated USD 819 billion by 2030, despite losses in primary steel capacity
  - International implications mixed: likely losses for iron ore producers (Australia, Brazil and India) but gains for most developing countries benefiting from lower steel prices.
  - Watch out for increasing demand of coal in electricity production! – Alignment with energy transitions clearly needed
  - Recent innovation transforms recaptured steel into liquid metals that can be applied to high-tech

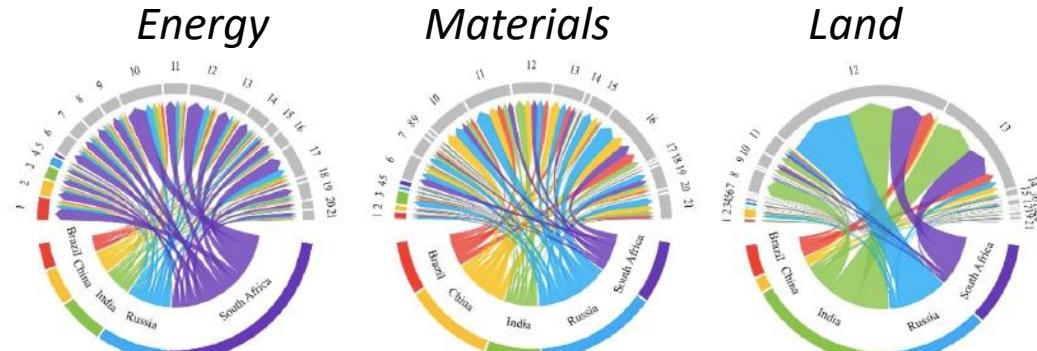
## 4) A nexus approach helps to emphasize the need to re-use critical materials and establish a CE on metals

- Time gaps between need to accelerate climate action and bring sustainable resources on stream
- Case Cobalt for e-vehicles in the EU (Baars et al 2020)
  - Cobalt flows analysis conducted
  - Total Co demand for EU EVs could reach 26.2 kt in 2030 and 57.4 kt in 2050, equal to 22% and 48%, respectively, of global Co mine production in 2017
  - Efficient recycling system is key



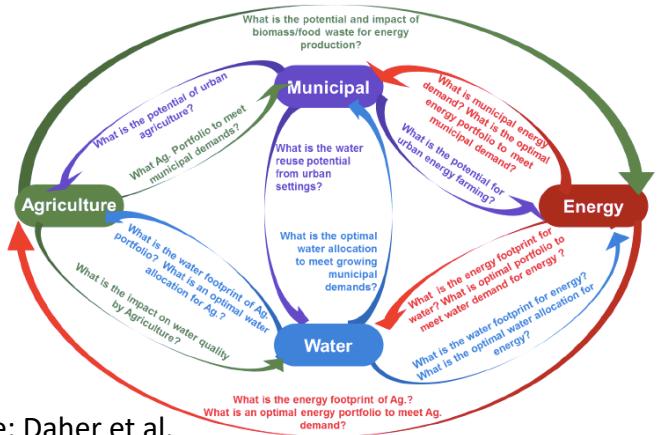
## 5) The Nexus: Addressing Multi-Level Governance

- Transcending the limits of a territorial approach, engaging with multiple actors
- Case I: Embodied emissions and footprints (Jordan/Bleischwitz 2020): construction industry rallying behind
- Case II: Urban mobility in the Ruhr Valley (Melkonyan et al. 2020): increase investments by factor four delivers zero carbon by 2030
- Case III: Footprints in BRICS countries (Tian Xu et al.)



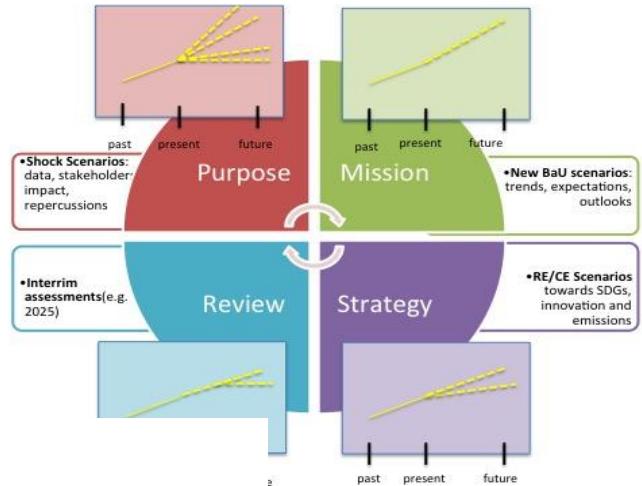
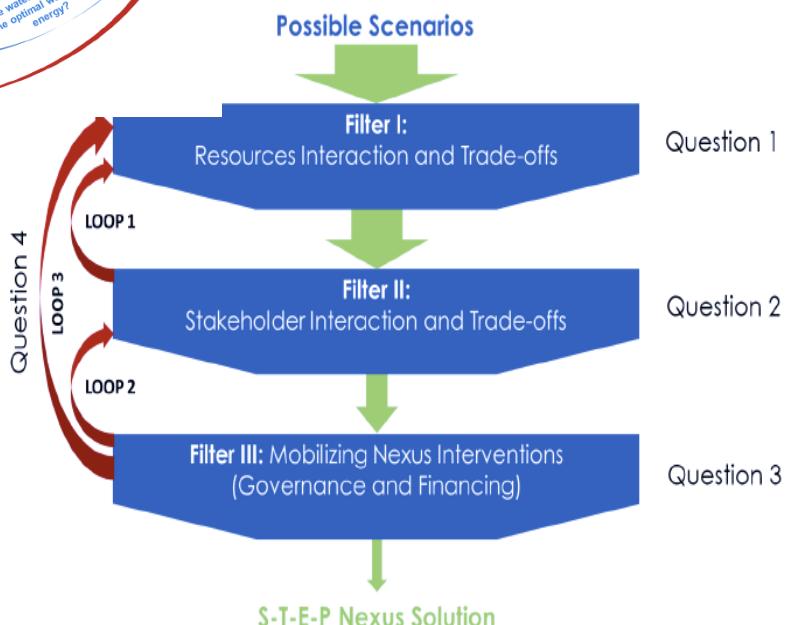
## 6) The Nexus enables looking ahead

...asking the right questions...



Source: Daher et al.

...developing scenario narratives



Bleischwitz et al, Nat Sust, 2018

...engage in missions  
for SDGs and  
sustainable &  
inclusive growth...

# Mobilising New Alliances

## Coalitions of the Willing, 1<sup>st</sup> and 2<sup>nd</sup> Mover, Up-scaler



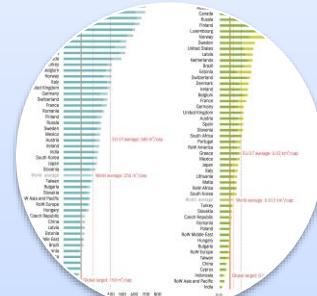
### New Plastics Economy

- HM, Unilever, Pepsi Cola, Nestle...
- Various Regulations
- Ambitious Targets: 100% by 2025
- Research on DCs to add



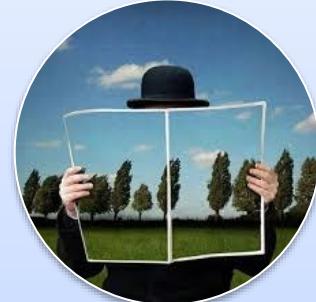
### Green ICT and FabLabs

- Fits to Low Carbon & CE
- Open access and inclusive institutions
- Cases for Africa



### Footprints & LCA

- Methods and data on carbon, water, materials well established
- In line with 'scope 2 + 3' inventories
- Interest from investors and business
- More EPDs and PCFs



### Transparency

- Emerging in anti-corruption efforts
- Certification for conflict minerals (case: Coltan)
- EITI and due diligence
- Implementation, enforcement and...extensions

Evidence on 'what works', mutual learning and assessments, transforming findings into roadmaps



## References

Baars, J. et al (2020) Circular economy strategies for electric vehicle batteries reduce reliance on raw materials, *Nature Sustainability*, <https://doi.org/10.1038/s41893-020-00607-0>

Bleischwitz, R. et al (2018), *Handbook of the resource nexus*, Routledge.

Bleischwitz, R. et al. 2018b. Resource nexus perspectives towards the United Nations Sustainable Development Goals, *Nature Sustainability*, <https://doi.org/10.1038/s41893-018-0173-2>

Biggs, E. M. et al. (2015) Sustainable development and the water–energy–food nexus: A perspective on livelihoods. *Environmental Science and Policy* 54, 389–397

Carvalho, P. et al. (2019) Integration of Water and Energy Planning to Promote Sustainability, *Journal of Sustainable Development of Energy, Water and Environment Systems* 7 (2): 229-252

Daher, B. et al. (2018) Developing socio-techno-economic-political (STEP) solutions for addressing resource nexus hotspots. *Sustainability* 10, 512

Geng Yong, Sarkis, J., Bleischwitz R. (2019) Globalize the circular economy, *Nature*, 10 Jan 2019: 153 – 155

Jordan, Nino, Bleischwitz, Raimund (2020) Legitimating the governance of embodied emissions as a building block for sustainable energy transitions, *Global Transitions*, <https://doi.org/10.1016/j.glt.2020.01.002>

Laspidou, C.S. et al. (2020) Systems thinking on the resource nexus: Modeling and visualization tools to identify critical interlinkages for resilient and sustainable societies and institutions. *Science of the Total Environment* 717. <https://doi.org/10.1016/j.scitotenv.2020.137264>

Melkonyan, Any et al (2020) Integrated urban mobility policies in metropolitan areas: A system dynamics approach for the Rhine-Ruhr metropolitan region in Germany, *Sustainable Cities and Societies*, <https://doi.org/10.1016/j.scs.2020.102358>

Nechifor, V. et al. (2020) Steel in a circular economy: Global implications of a green shift in China. *World Development* 127

Semertzidis, T. et al. (2019) The Nexus: Estimation of Water Consumption for Hydropower in Brazil. *J. sustain. dev. energy water environ. syst.*, 7(1), pp 122-138, 2019, DOI: <https://doi.org/10.13044/j.sdewes.d6.0229>

Tian Xu et al (2020) Examining the role of BRICS countries at the global economic and environmental resources nexus. *Journal of Environmental Management* 262. <https://doi.org/10.1016/j.jenvman.2020.110330>



**Thank you!**

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