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# The stock-flow-service nexus: new directions for social-ecological transformation research

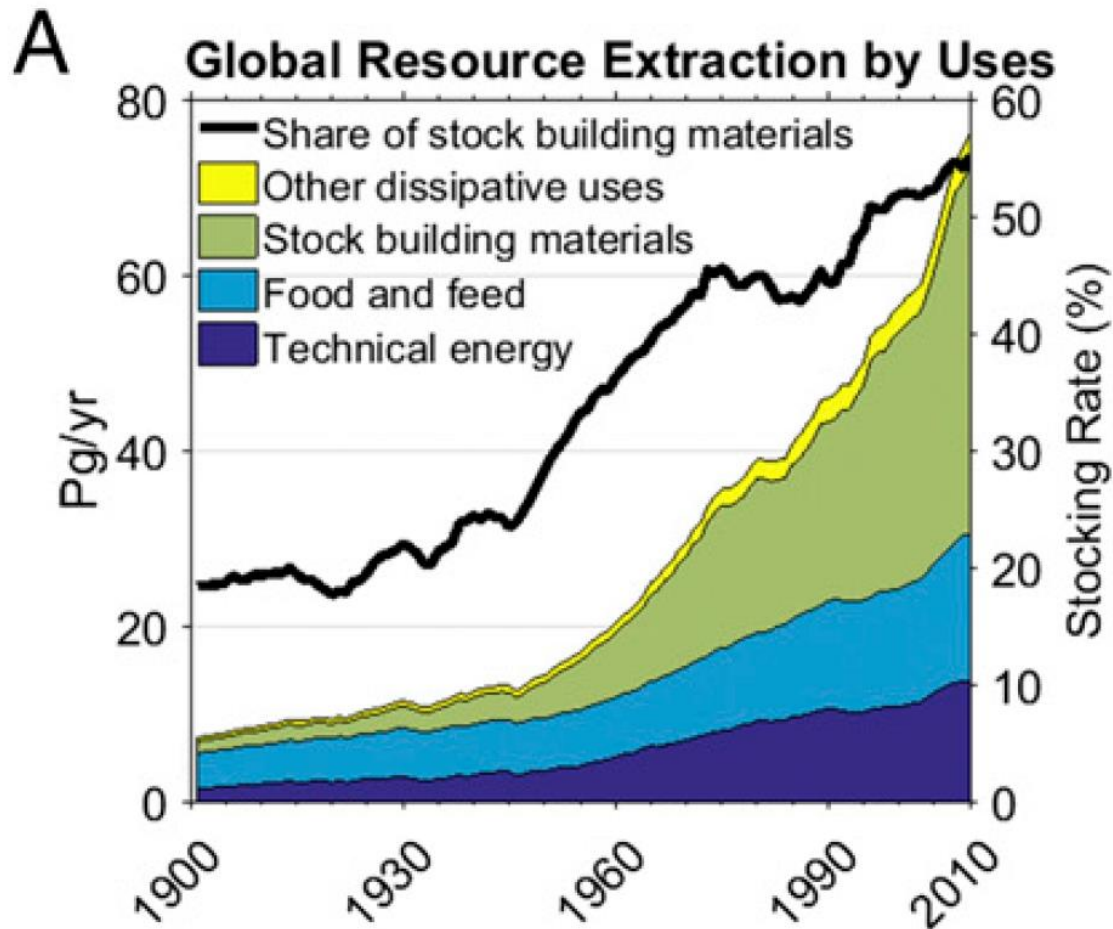
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Christina Plank, Helmut Haberl**  
Institute of Social Ecology, Vienna

**4th OSM – GLP, Bern, 26.April 2019**

# Toward stockpiling society (*not* throwaway society)

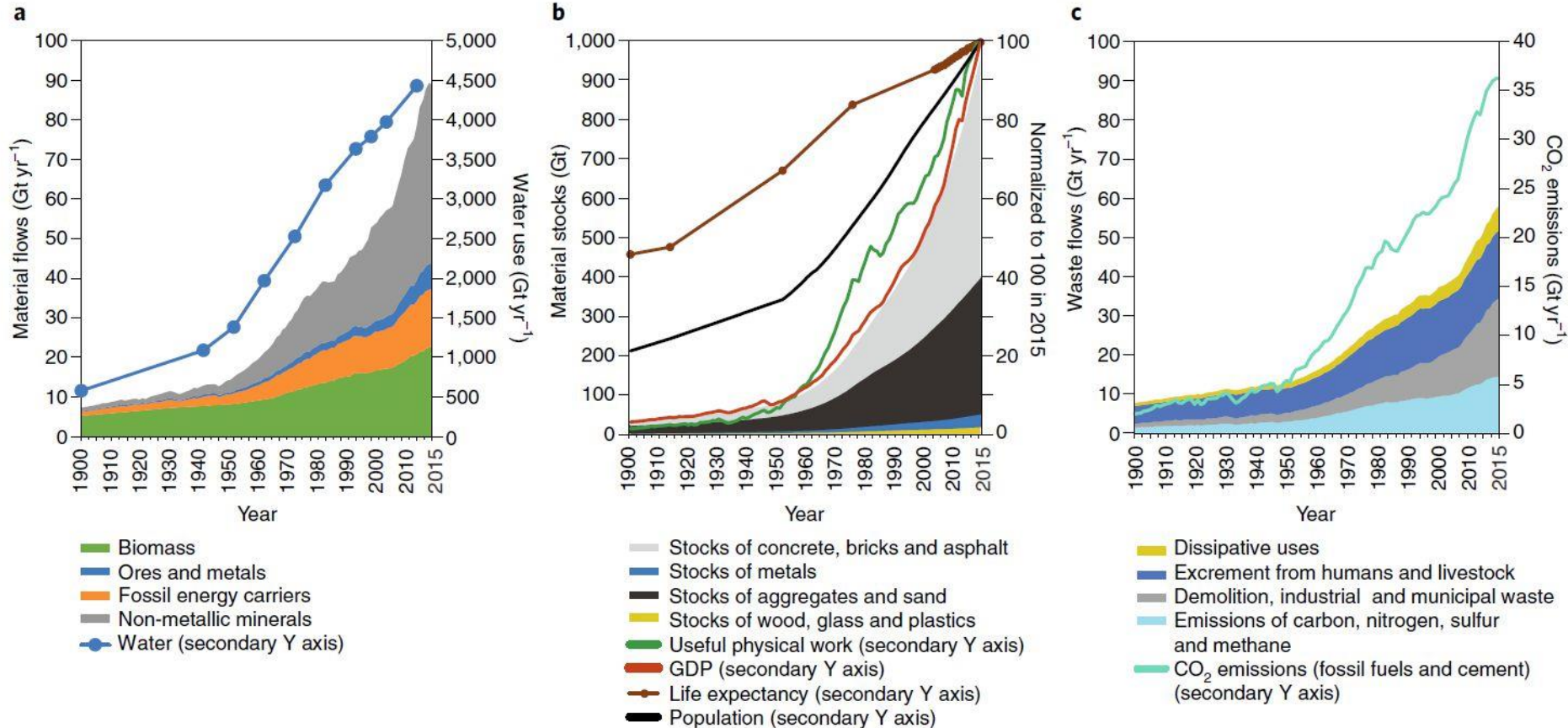


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# Social metabolism in the 20th Century

## century of inflows, outflows and stock accumulation



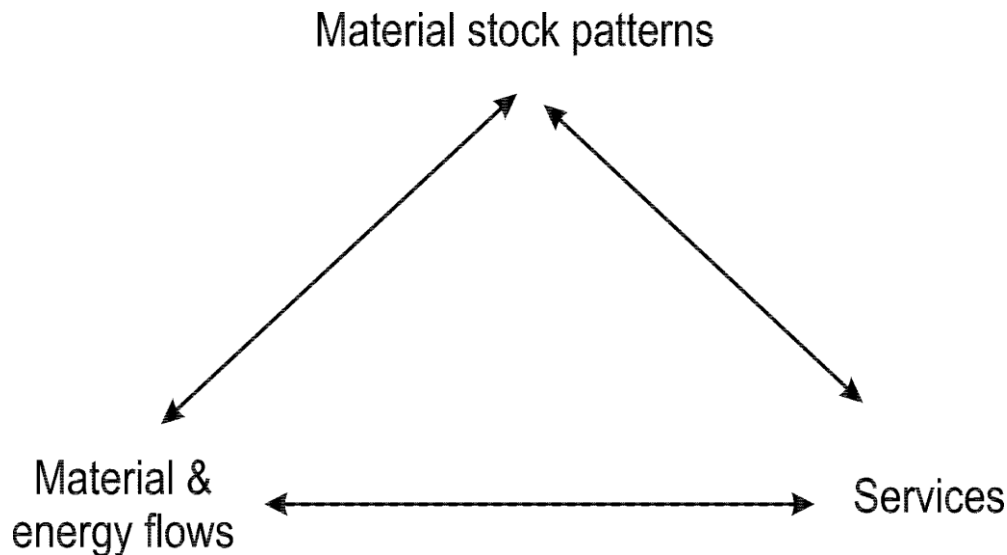
# The Challenge

- **material stocks** (e.g. infrastructures, buildings, dams) **enable certain modes of production and living**
- but **determine further resource use** (e.g. energy)
- and **restrict alternative pathways** => **lock-in** effects
- current trajectories **major obstacle for sustainable resource use** levels
  - **no evidence** that **resource efficiency** is effective
  - **more recent transformations even more challenging**  
(no absolute decoupling, 2. “Great Acceleration” since 2004?)
- how to **identify alternative pathways?**  
=> **Stock-Flow-Service-Nexus** as conceptual approach

# The stock-flow-service-nexus



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the idea: **reducing** resource use by  
determine **alternative options**  
for **service provisioning**

- needs clarity about **services**
- calculate their **relations** to **flows** and **stocks**
- how to determine **alternatives?**
- what **possibilities or obstacles** exist for **implementing** alternative options?

# The Energy-Service-Cascade

(Kalt et al. 2019 in: Energy Research and Social Sciences 53, 47-58)



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services **distinct**

- from **stocks** and **functions**
- and from **benefits** and **values** (and **interests**)

- **who** benefits?
- **and why?**

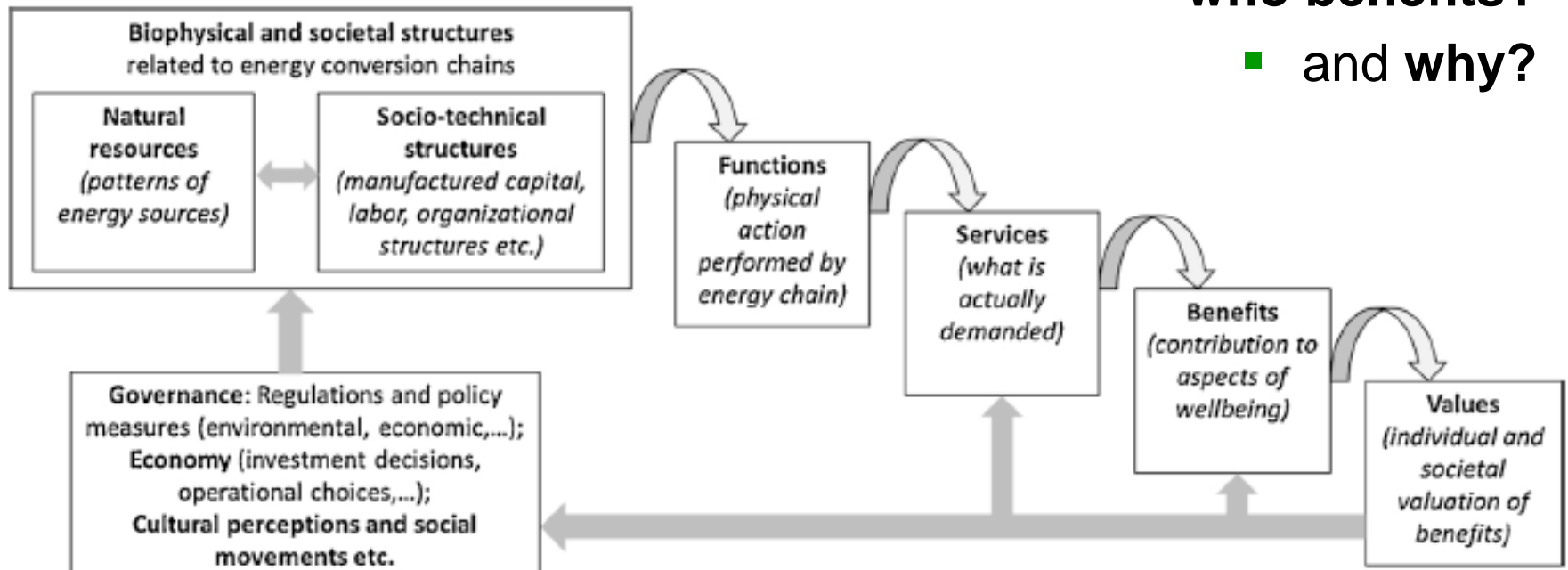
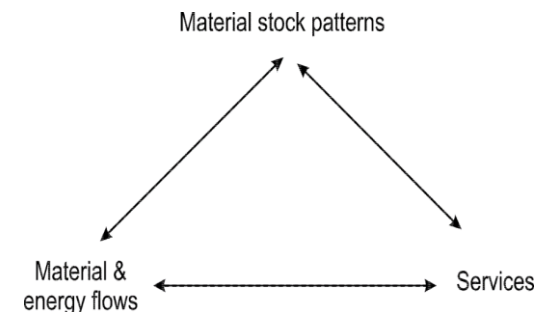


Fig. 1. The 'Energy Service Cascade' (ESC) as adapted and expanded from Haines-Young and Potschin [9,18].



# Basic characteristics of services

- different from functions:  
**physical work/energy  $\neq$  societal service**
- but also from benefits:  
**specific** for certain **social groups**
  - **privileges** some while **discriminating** others (e.g. mobility: road construction, energy provision: construction of dams or power plants, energy grids etc.)
- building of stocks very often **contested**
  - **domestic** (“Stuttgart21”, Vienna Airport etc.)
  - **international**: geopolitical strategies (oil & gas pipelines, Belt-Road-Initiative etc.)
- **spatially explicit: restructuring of societies**
- **state(s) play an important role**



# Biophysical and societal dimensions



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- **Provisioning systems as a bridging concept\***
- developed within **Political Economy** (Ben Fine: Systems of provisions – linking consumption to production)
- applied also in **social-ecological** projects:  
**LiLi** (J. Steinberger et al.: Living Well Within Limits)
- and **Institute of social-ecological Research** (ISOE, Frankfurt/M.)
  - **mediating the provision** of services
  - **social-ecological systems (SES)**
  - focus on **actors, knowledge, technologies, institutions** (state)



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\* Plank, C., Liehr, S., Görg, C.: Provisioning systems and their implications for the transformation of the stock-flow-service nexus. paper presented at the 2. Austrian Resource Conference, Innsbruck 1. March 2019

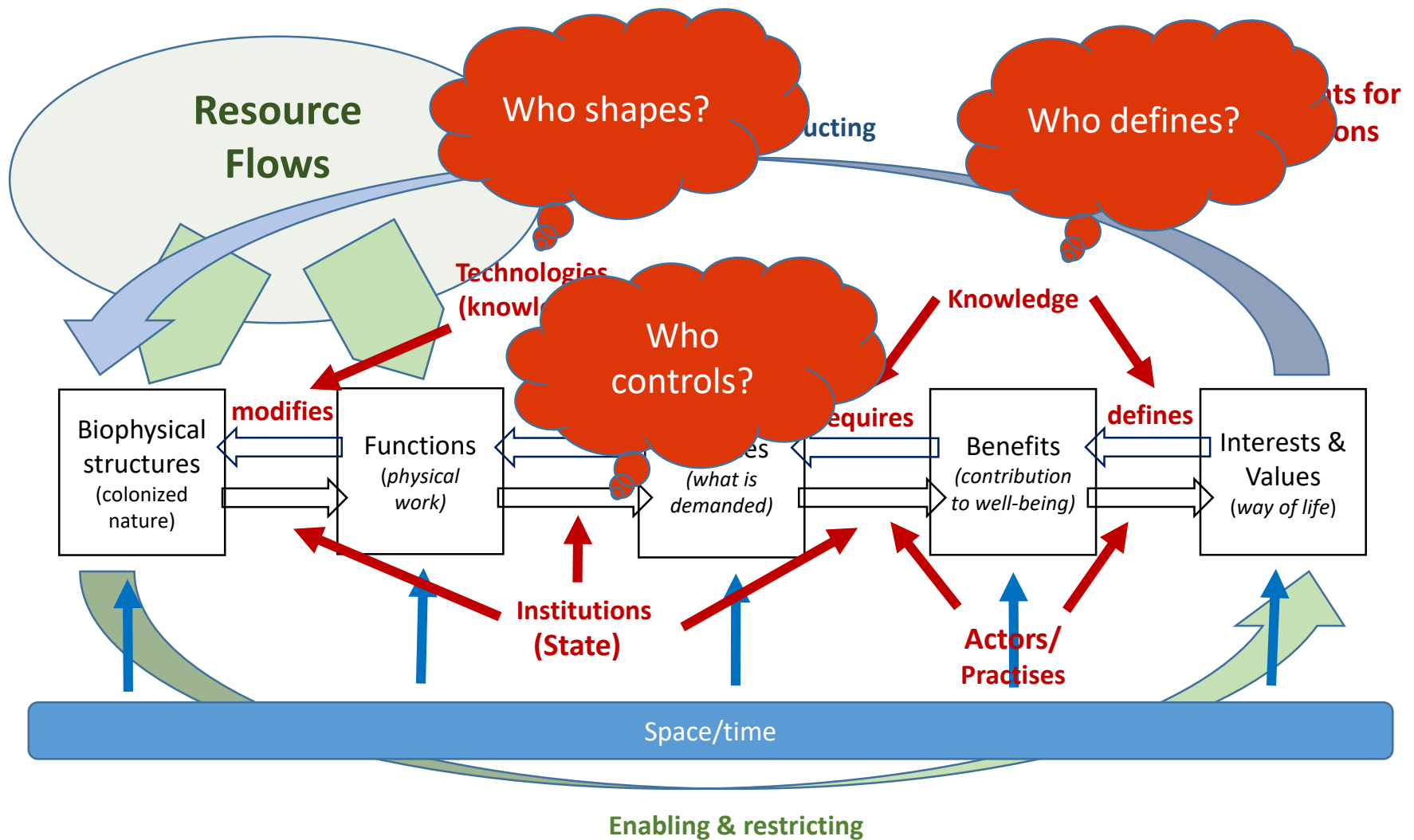


# ISOE Concept of Provisioning Systems



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# Conclusions and way further

- Stocks, i.p. infrastructures highly **contested** due to **spatial restructuring** of societies involved in their building (D. Harvey: temporal-spatial fix)
- **Provisioning Systems** as entry point for empirical analysis
  - systemic approach, but including **actors, knowledge, institutions, power relations**
- **States** not only an actor but also an **authority** for **conflict “resolution”**
  - **strategic selectivity** towards economic growth
  - Today: shifts towards **geopolitical-territorial logic**
- **possible empirical focus: urbanization and mobility**
  - focus on the twin capitals: Vienna and Bratislava?
  - building of roads, public transport, airports, also housing
  - conflicts e.g. on airport and highways

A photograph of a landscape where several wind turbines are installed on a hill. The foreground and middle ground are covered with numerous tree stumps and fallen branches, indicating recent deforestation. To the left, a small cluster of tall, dark evergreen trees remains. The sky is blue with scattered white clouds. The text 'Thank you very much for your attention!' is overlaid in the upper right, and the contact email 'christoph.goerg@boku.ac.at' is in the lower right.

**Thank you very much  
for your attention!**

contact: [christoph.goerg@boku.ac.at](mailto:christoph.goerg@boku.ac.at)