

Implementation of Sustainable Development Goals in Construction Industry

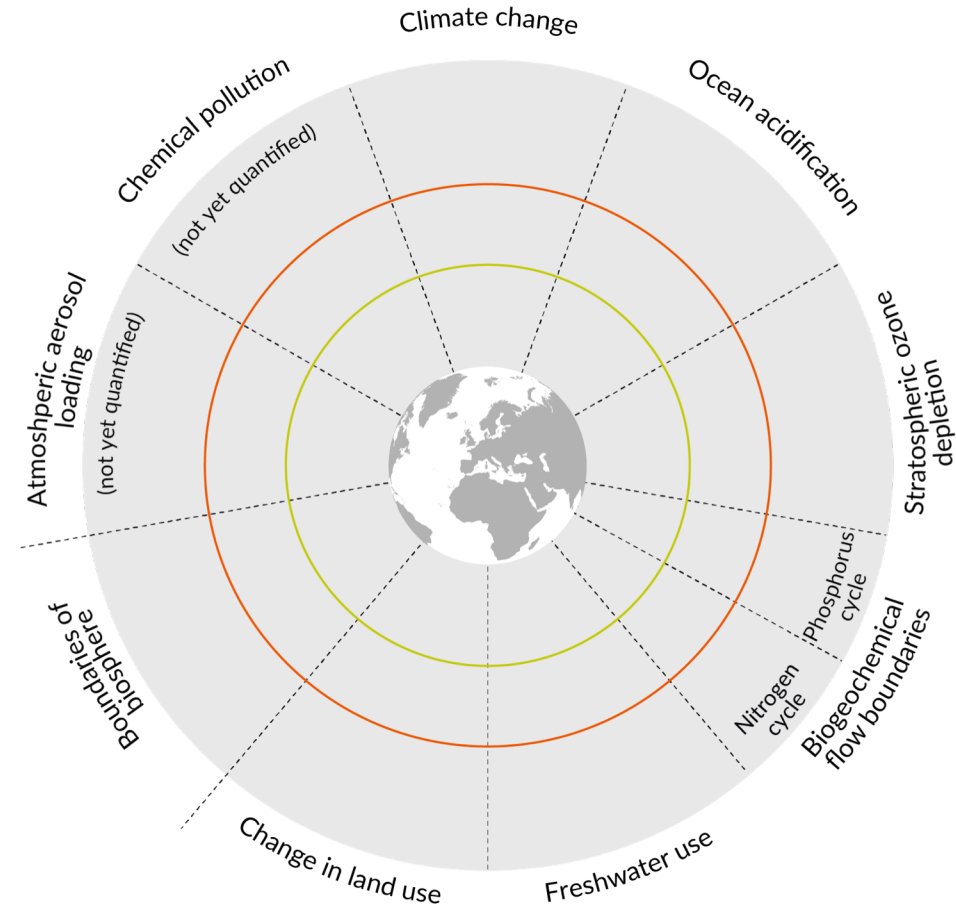
A Systemic Consideration of Synergies and Trade-offs

A. Wieser, September 13th, SBE 2019, Graz

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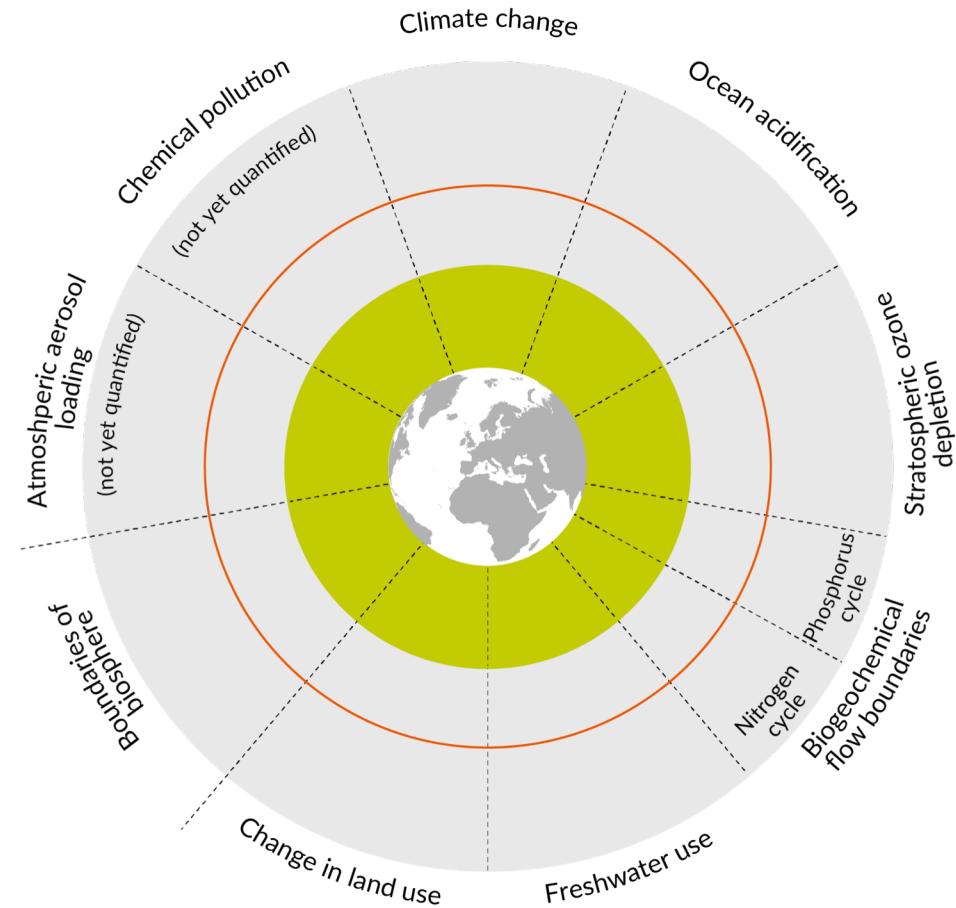
- CONTEXT
- RESEARCH QUESTIONS and METHODOLOGY
- RESULTS
- CONCLUSION AND OUTLOOK

Planetary boundaries



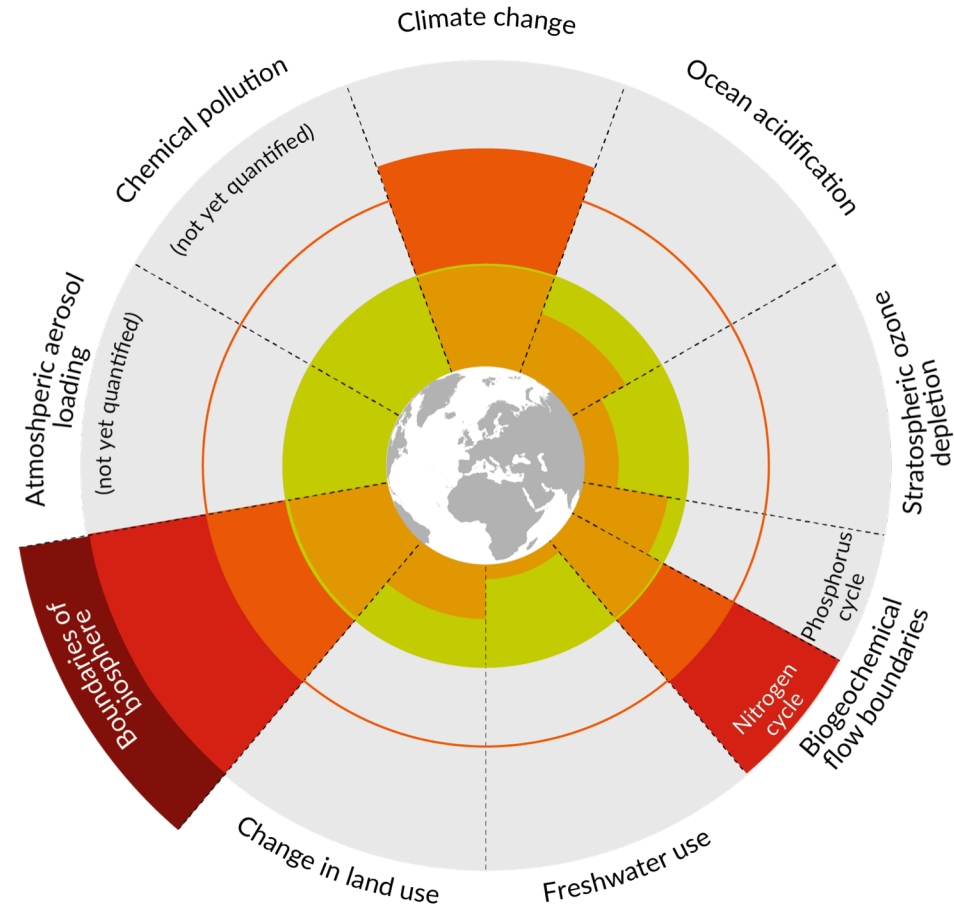
Source: AGNHB according to J. Rockström, et al., "A safe operating space for humanity," *Nature*, vol. 461, no. 7263, pp. 472–475, Sep. 2009.

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Sustainable Development Goals - a global development agenda

- Agenda 2030 should be reached by 2030
 - 2015: United Nations adopted the SDGs
 - Follow-up of the 8 Millennium Development Goals (2000-2015)
 - 17 goals, 169 sub targets, 232 indicators
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- EU: SDG indicators defined by Eurostat
 - National level: different national indicators
 - Austria: indicators defined by the „Statistics Austria“



 **SUSTAINABLE
DEVELOPMENT** **GOALS**

http://io.wp.com/www.un.org/sustainabledevelopment/wp-content/uploads/2015/12/english_SDG_17goals_poster_all_languages_with_UN_emblem_1.png?resize=728%2C451

Construction sector and its environmental impact

- Resources – **material and water**, e. g. buildings use around 25 % of global water (Int. Resource panel 2017)
- **36 % of final energy** use caused by buildings and construction (Global Alliance for Buildings and Construction 2017)
- Responsible for **39 % of GHG-emissions** (Global Alliance for Buildings and Construction 2017)
- **Embodied energy and embodied energy emissions** from construction industry amount 20 % of global energy consumption and CO2 emissions (IEA 2018)
- **Land consumption**
- **Biodiversity**



Source: W SBE 2020, (2017, Int. Resource panel), (2017, Global Alliance for Buildings and Construction)

SDG implementation: SDGs as national issue in Austria

- Government side: **mainstreaming approach**
 - Interministerial working group on „Implementation Agenda 2030 for Sustainable Development“
- Implementation **criticized** by the **Austrian Court of Audit** (Rechnungshof) (2018)
- Civil society side: **SDG Watch Austria** – open letter for better implementation of SDGs (2017)
e.g. more stakeholder involvement, comprehensive gap analysis
- Science side: **UniNEtZ-project** – proactive approach of science, science-society-policy dialogue, concrete action paper report to the Austrian government

SDGs, the built environment and systemic approaches

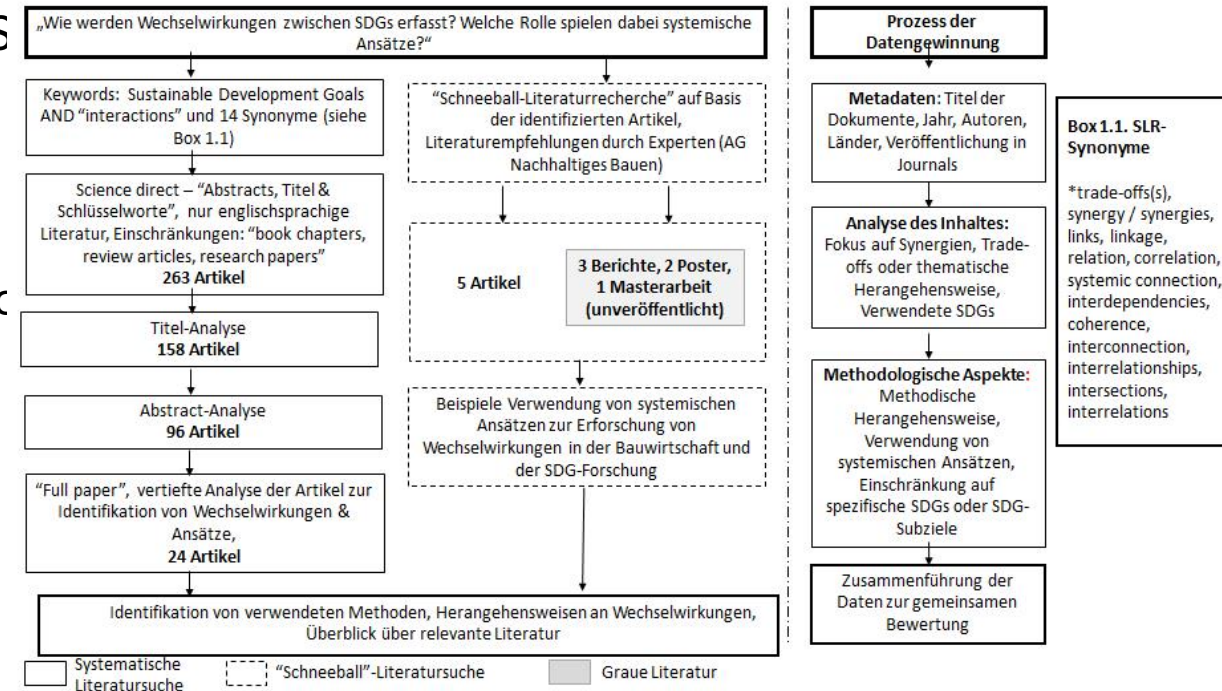
- SDG are integrated, interconnected, systemic character
- Trade offs and synergies in SDG implementation
- Importance of systemic approaches in sustainable construction ist growing (due to complexity)

Research Questions for SLR

- "Which systemic approaches in context of the SDGs exist?"
- "Why is a systemic approach indispensable for illustrating the interdependencies among SDGs?"

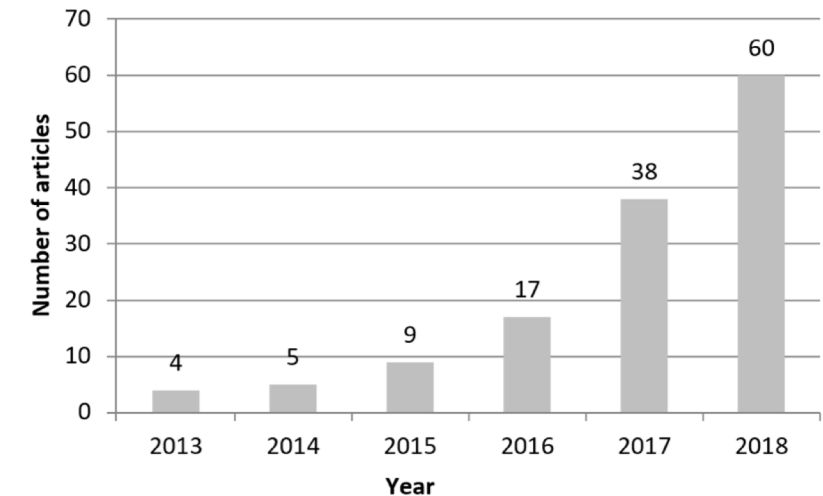
Methodology

- State-of-the-Art of the application of systemic approaches in context with SDGs: systematic literature research (Science direct)
- Linking concrete actions to the SDG framework for identification and visualization of synergies and trade-offs
- example: qualitative modelling with iMODELER



Interactions within SDGs

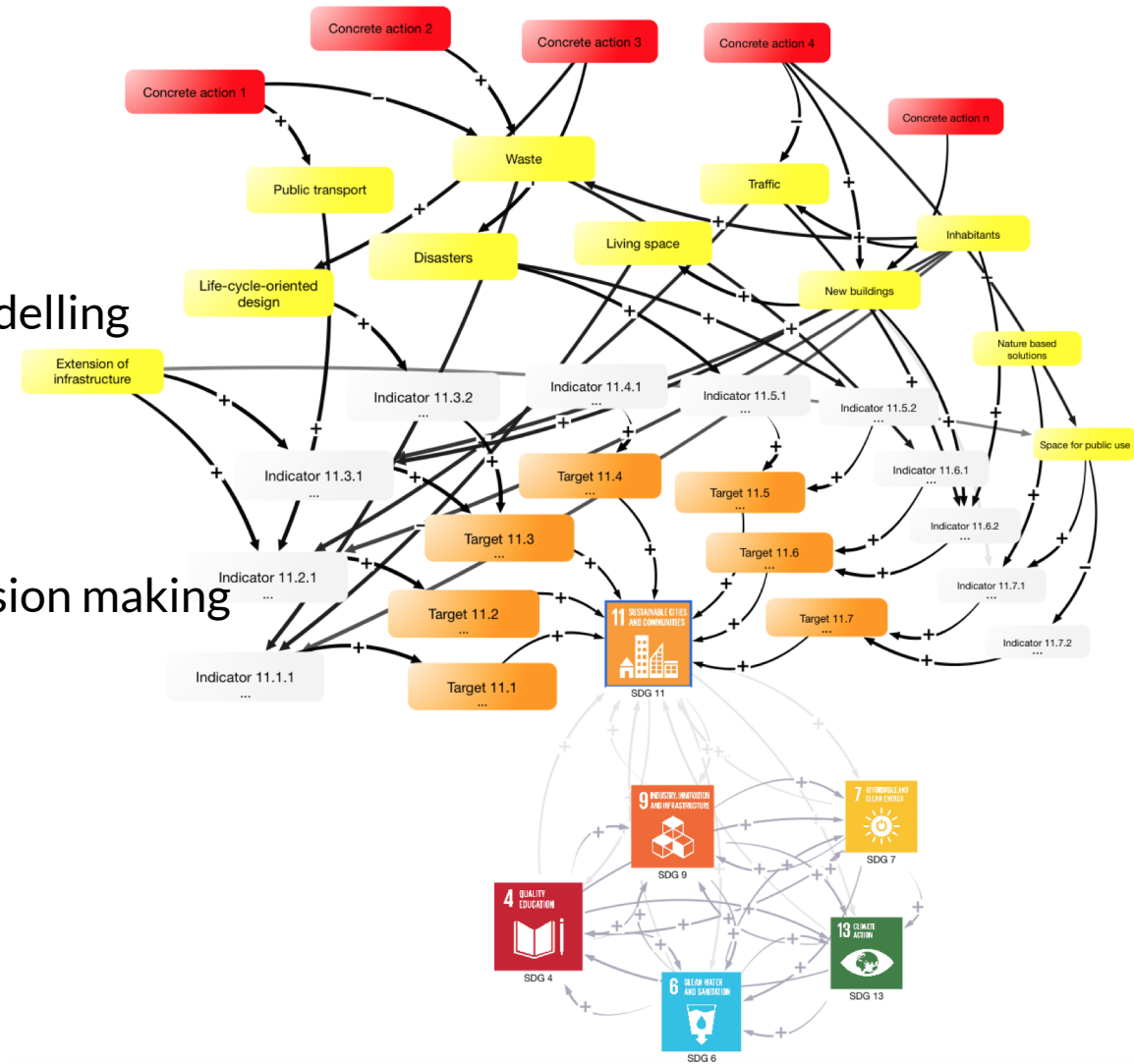
- Interactions within SDGs are a research topic of growing importance
- Systemic approaches are playing a relevant role in the analysis
→ Systemic approaches are frequent and necessary
- Scientists from various disciplines use approaches and methods to address the interactions
- Trade-offs and synergies are approached with of specific SDGs or SDG sub targets or specific topics like salinization
- Little literature on SDG interaction – tools to analyse complexity necess



Interactions – the example of iMODELER

iMODELER in general

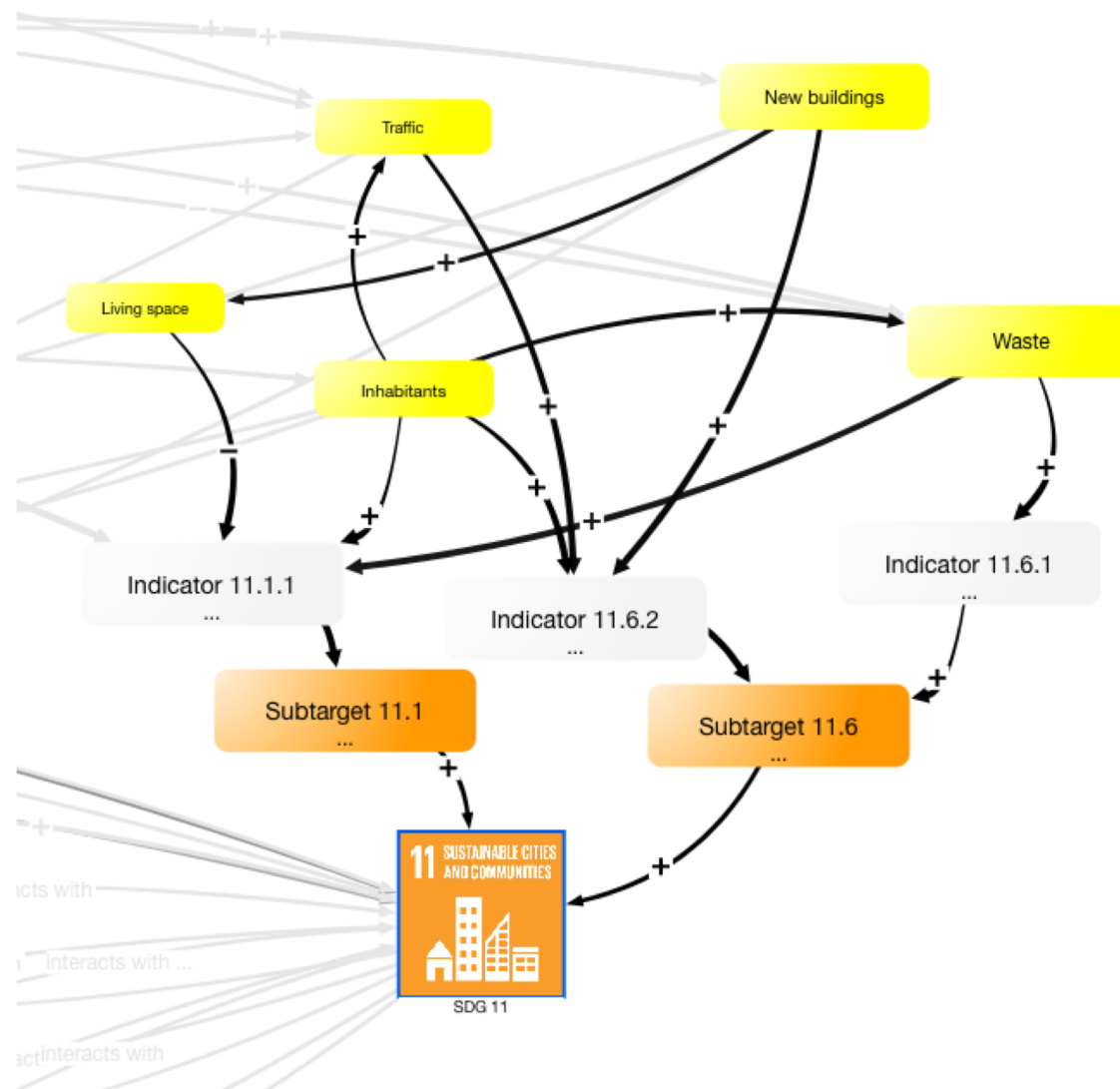
- Tool for qualitative explorative cause and effect modelling
- Possibility to assess trade offs and synergies
- Showing and visualizing interconnectedness
- Participatory modelling possible
- Goal: Improved planning, communications and decision making



iMODELER and SDGs

Applied example:

- SDG 11
- addressed in UniNEtZ working groups
- numerous interdependences among subject areas, SDG sub targets and SDG



Conclusions and Outlook

- Fast implementation of SDGs until 2030 is necessary in Austria
- SDGs can be a starting point for transformation of society in a sustainable way
- Need to rethink and redesign the building sector -> Agenda 2030 opportunity for lead and initiate change in the building sector and the built environment (e.g. integration of SDGs in sustainable constructions and topics related to the built environment)
- **System thinking and systemic approaches** relevant for SDG implementation, esp. sustainable construction
- **iMODELER** is an reasonable tool to
 - 1) model interdependencies among SDGs, targets and indicators
 - 2) to visualize synergies and trade-offs between different actions connected (e.g. systemic modelling in UniNEtZ project)
- Future goal to support decision makers to identify SDGs with least trade-offs and synergies and prioritized actions with the highest synergies and trade-offs

Thank you for your attention!

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Thank you for your attention!