

ENERGOOD – A modelling framework for common well-being optimised energy systems and its use in energy policy design

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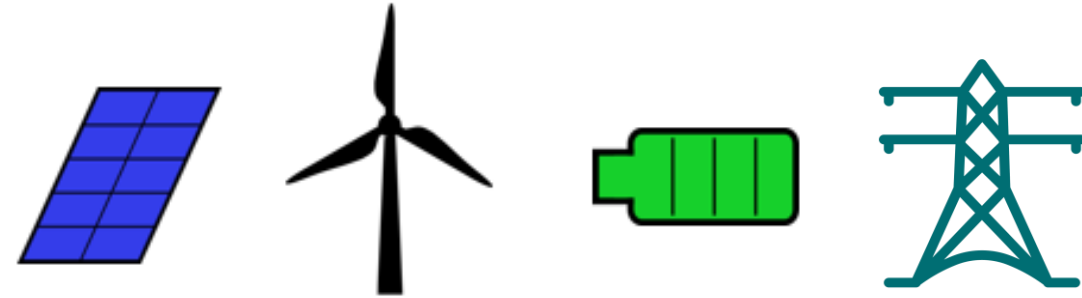
Common well-being assessment framework

Innovation: A novel framework for

- **Well-being optimisation and assessment** of energy system designs and investment decisions
- **Maps** with regional well-being effects from energy technologies
- **Policies discourse and design**, e.g. on sufficiency scenarios

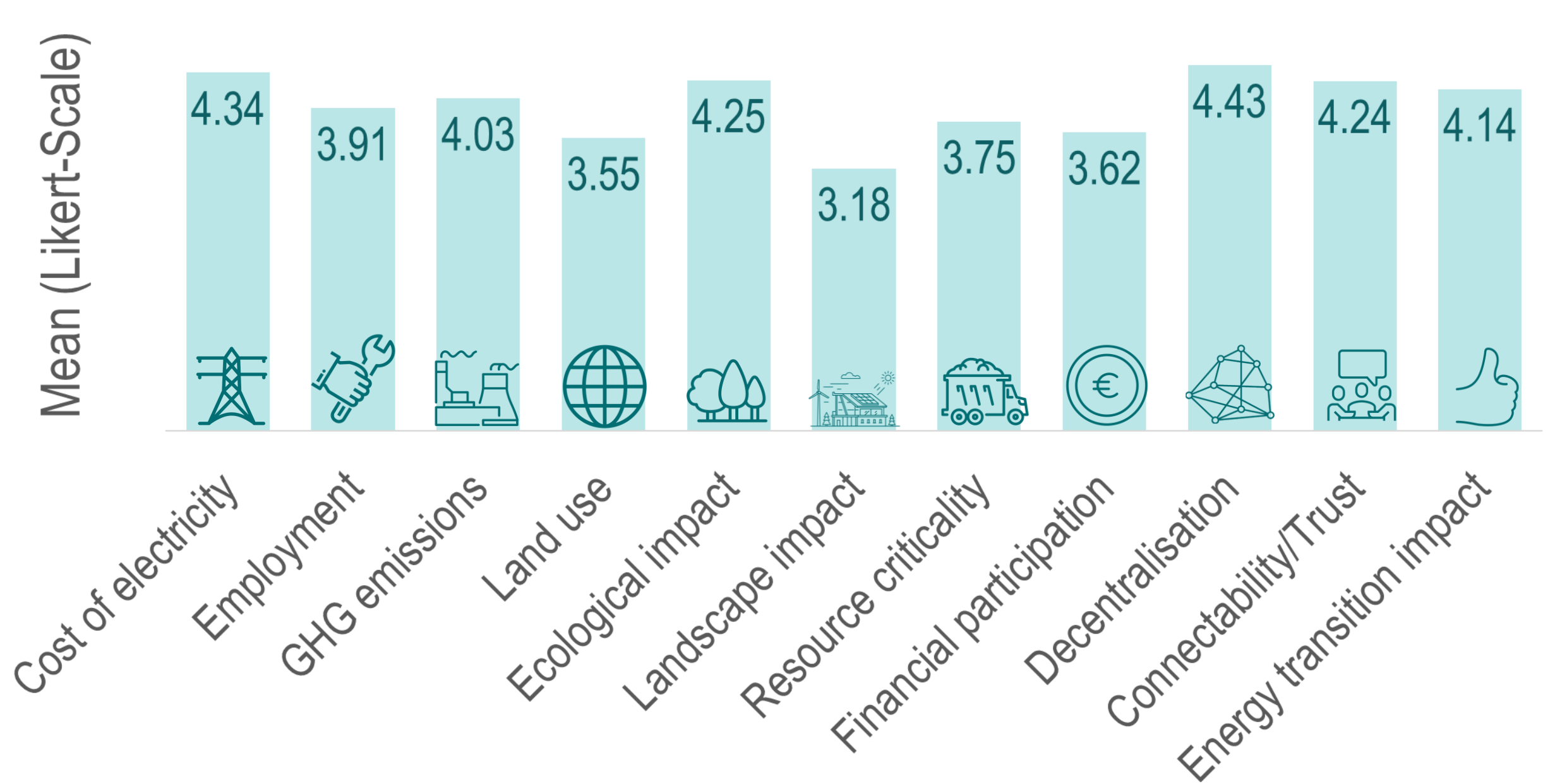
Object of investigation: properties and choices of **energy technologies**

- Photovoltaics (rooftop, balcony, open area)
- Wind energy (onshore, offshore)
- Storage technologies (electricity, gases)
- 25 energy technologies in total



Quantified well-being indicators

Weighting of indicators from a representative online survey for Germany (n = 1 019) in ENERGOOD



Scenarios



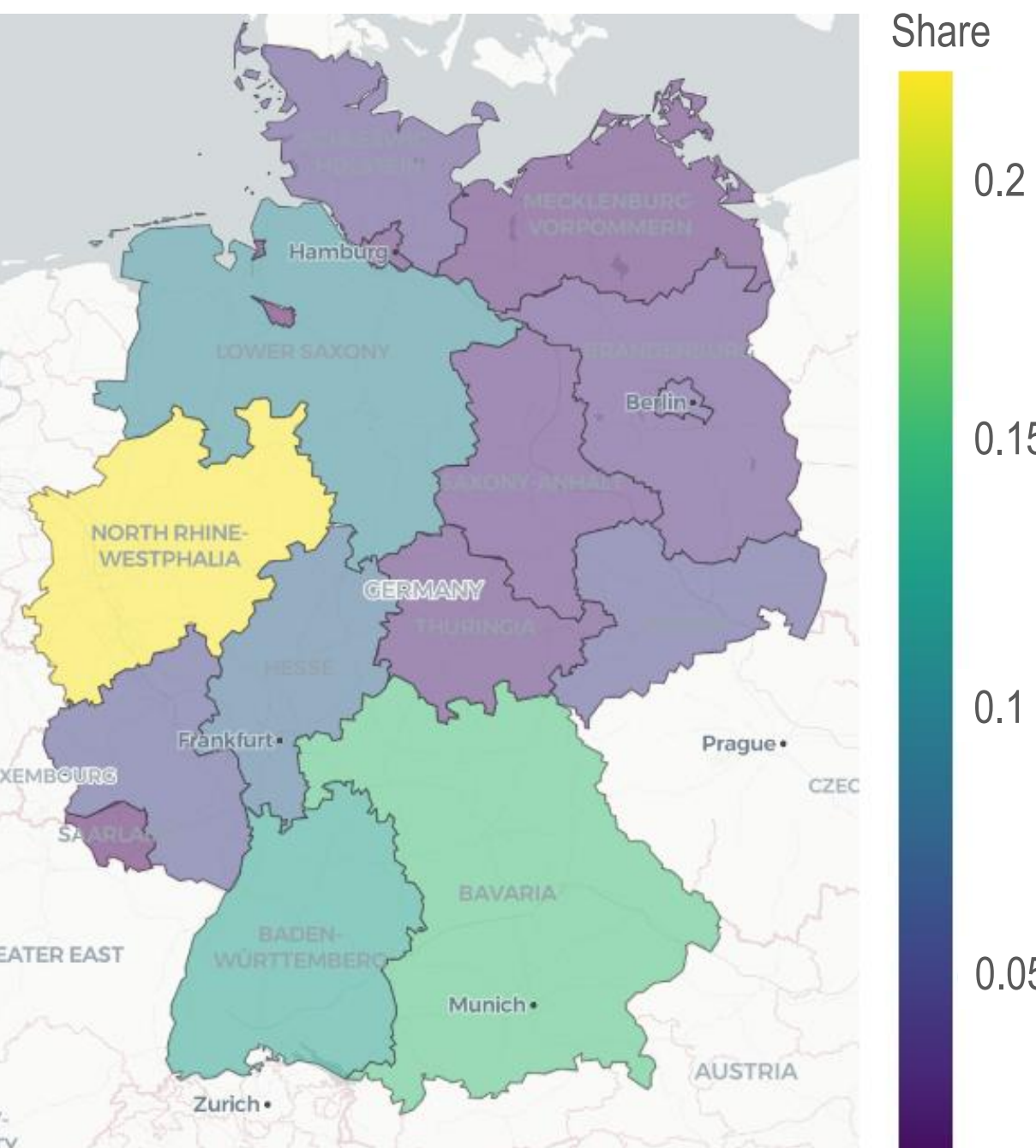
Energy demand scenarios

- Reference: Net-zero scenario until 2045 for Germany
- Sufficiency: „Contrast“ scenario with energy demand reduction

Regionalisation

- Disaggregation of energy demand to identify regionally different well-being effects

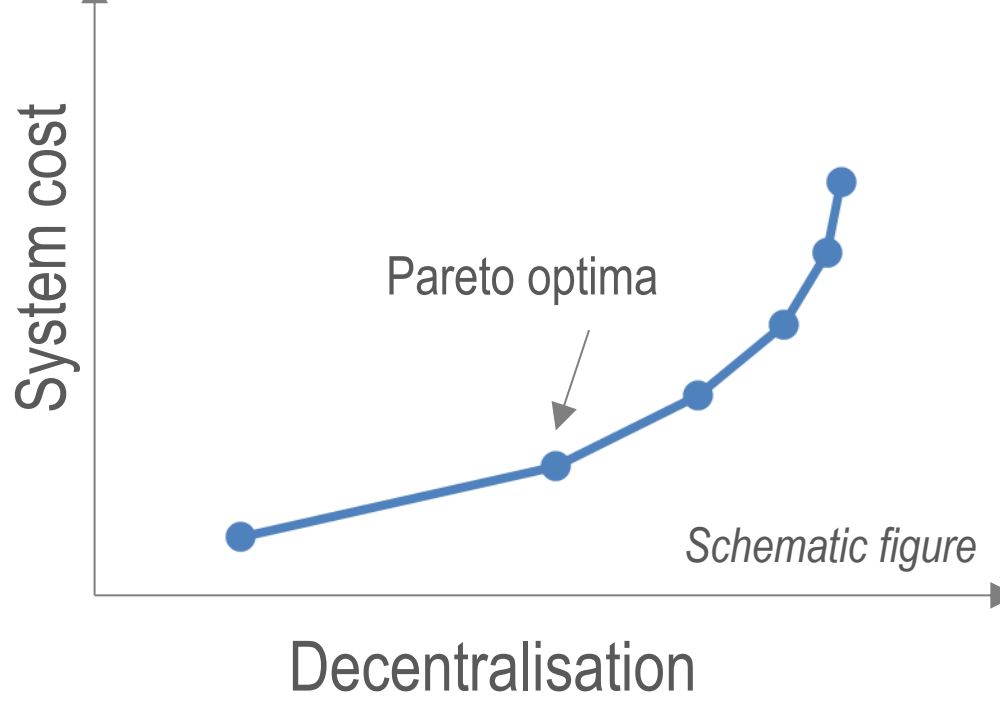
Regional shares of GDP and population



Energy system optimisation

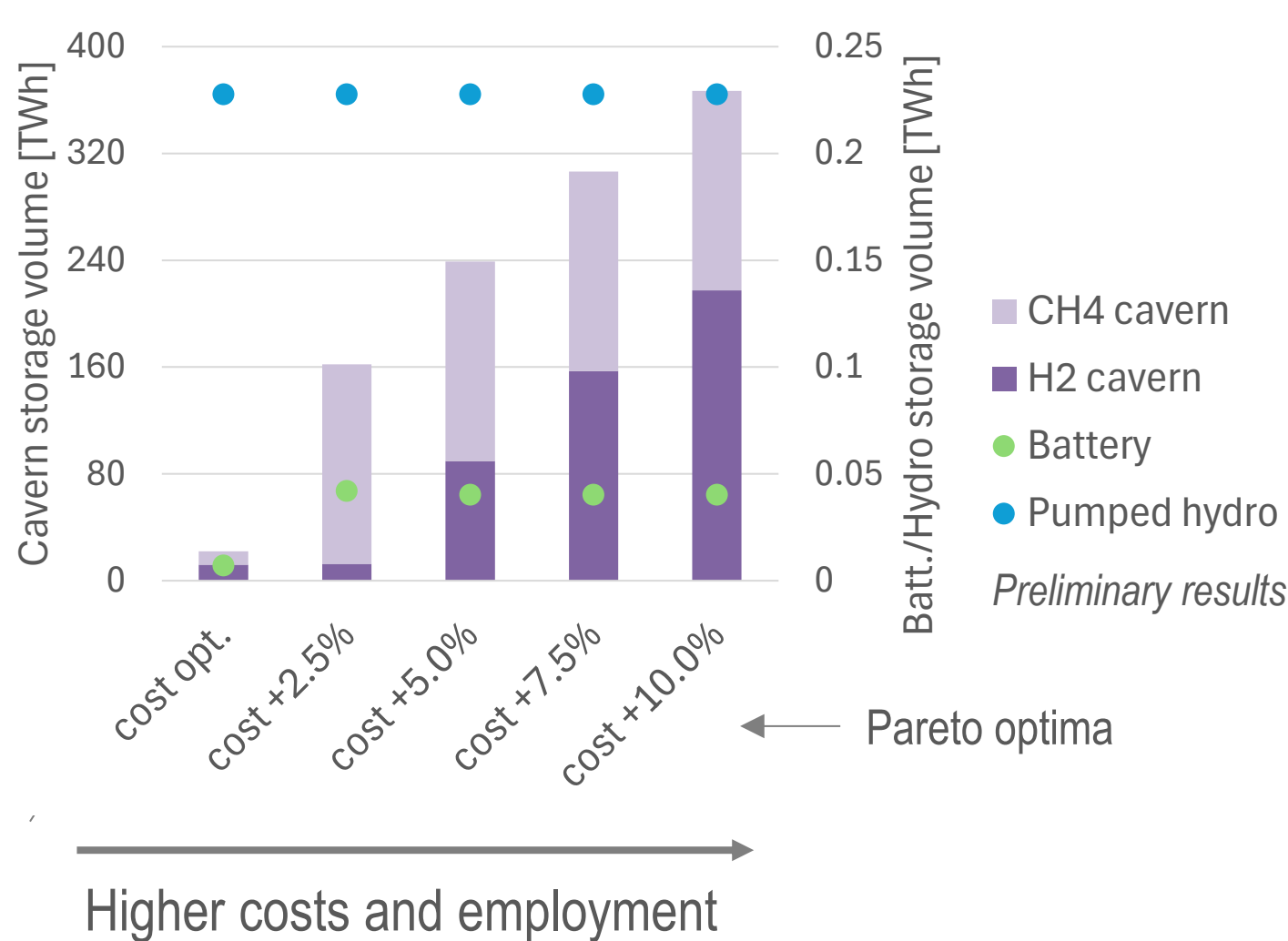


Pareto optimisation (ε-Constraint method)



First results (example):

- Optimisation of **employment effects** with up to 10% higher system costs

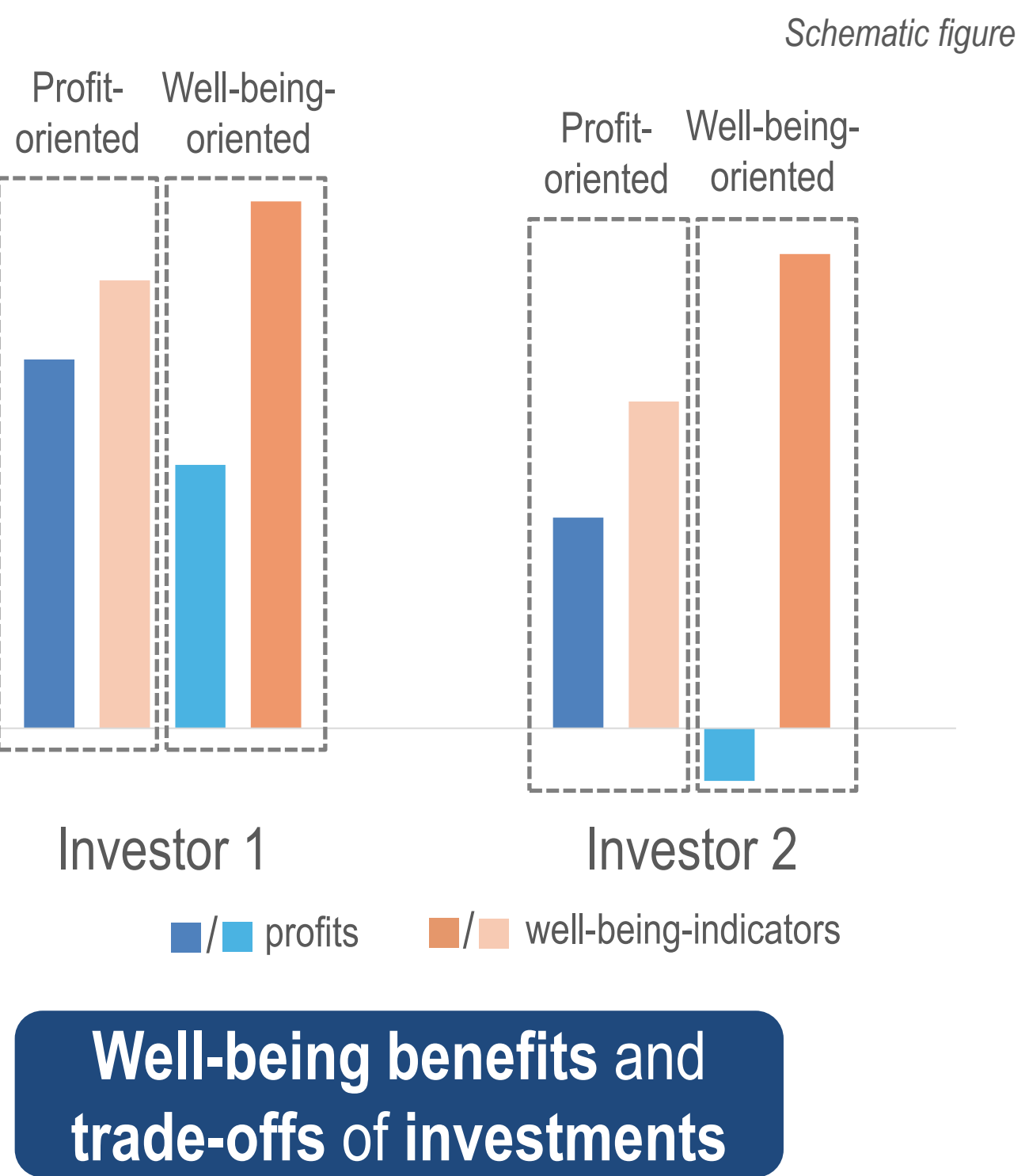


Actors perspective



Technology options

Agent-based model
Investment decisions resulting in technology portfolios



Energy policy design

1. **promote** energy system developments which yield a **maximum contribution to well-being**
2. **use remaining degrees of freedom** for common well-being contributions under given policies
3. indicate/quantify **co-benefits of sufficiency policies**
4. utilise the **framework** for **explorative and discursive processes** on
 - a. **insights** in policy implications for common well-being
 - b. **trade-offs** between well-being dimensions incl. costs

Supported by:



on the basis of a decision by the German Bundestag



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