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Senatsverwaltung
für Umwelt, Verkehr
und Klimaschutz

Energy efficient operation of heating and cooling systems – an organizational challenge

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Starting points

Demand

Energy-efficient operation of complex heating and cooling systems is necessary in order to achieve climate protection targets

Observation

Difference between technically possible and actually achieved energy efficiency

Questions

1. What kind of socio-technical barriers exists?
2. How can these barriers be explained theoretically and what conclusions can be drawn for practice?

Project: ENGITO

Energy saving by low-investment technical and organizational measures for complex heating and cooling systems

Interdisciplinary project team:

- Center for Technology and Society
- Department of Mechanical and Energy System Engineering

Project duration:

- 01/2017 until 08/2021

funded by:



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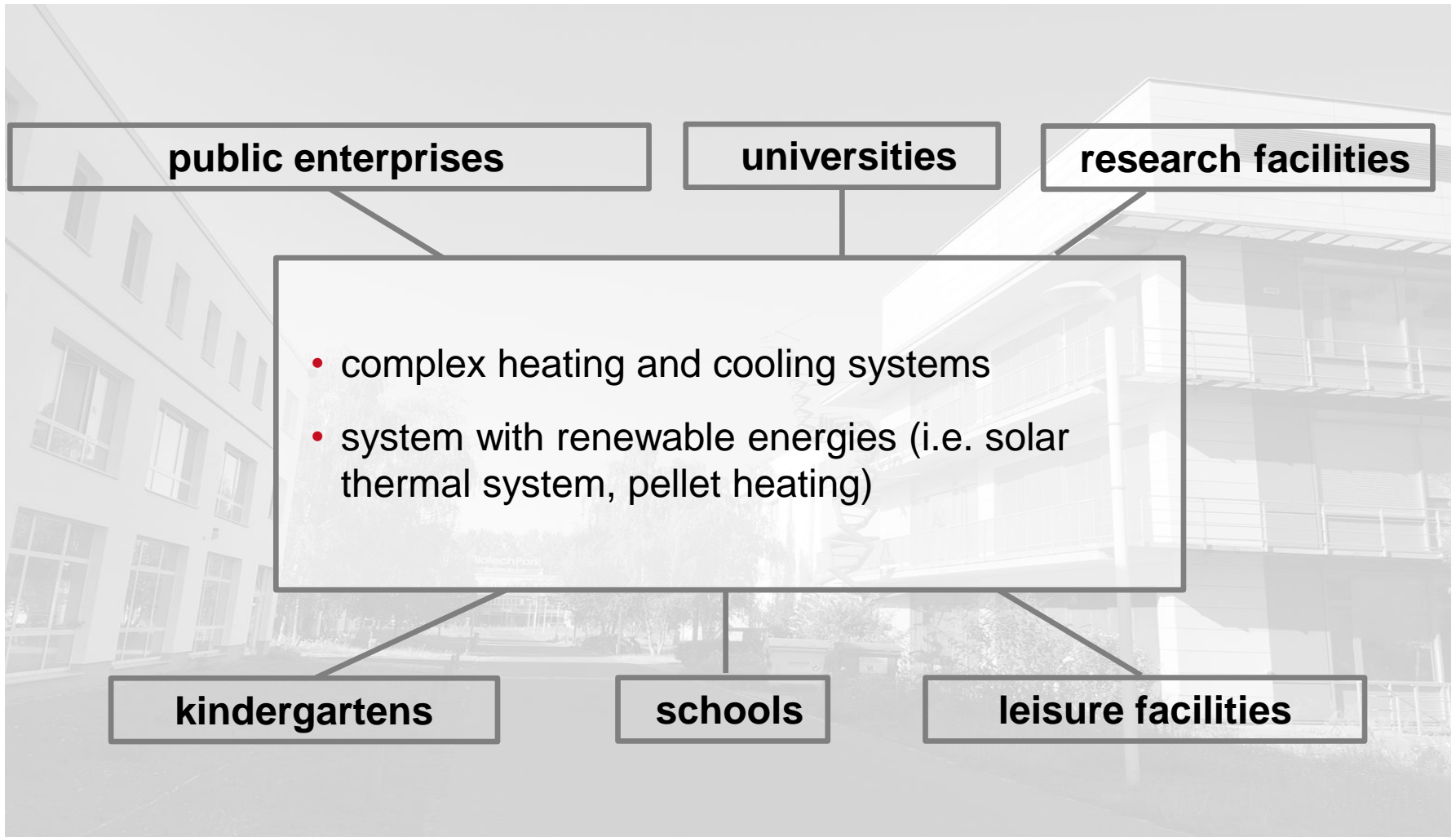


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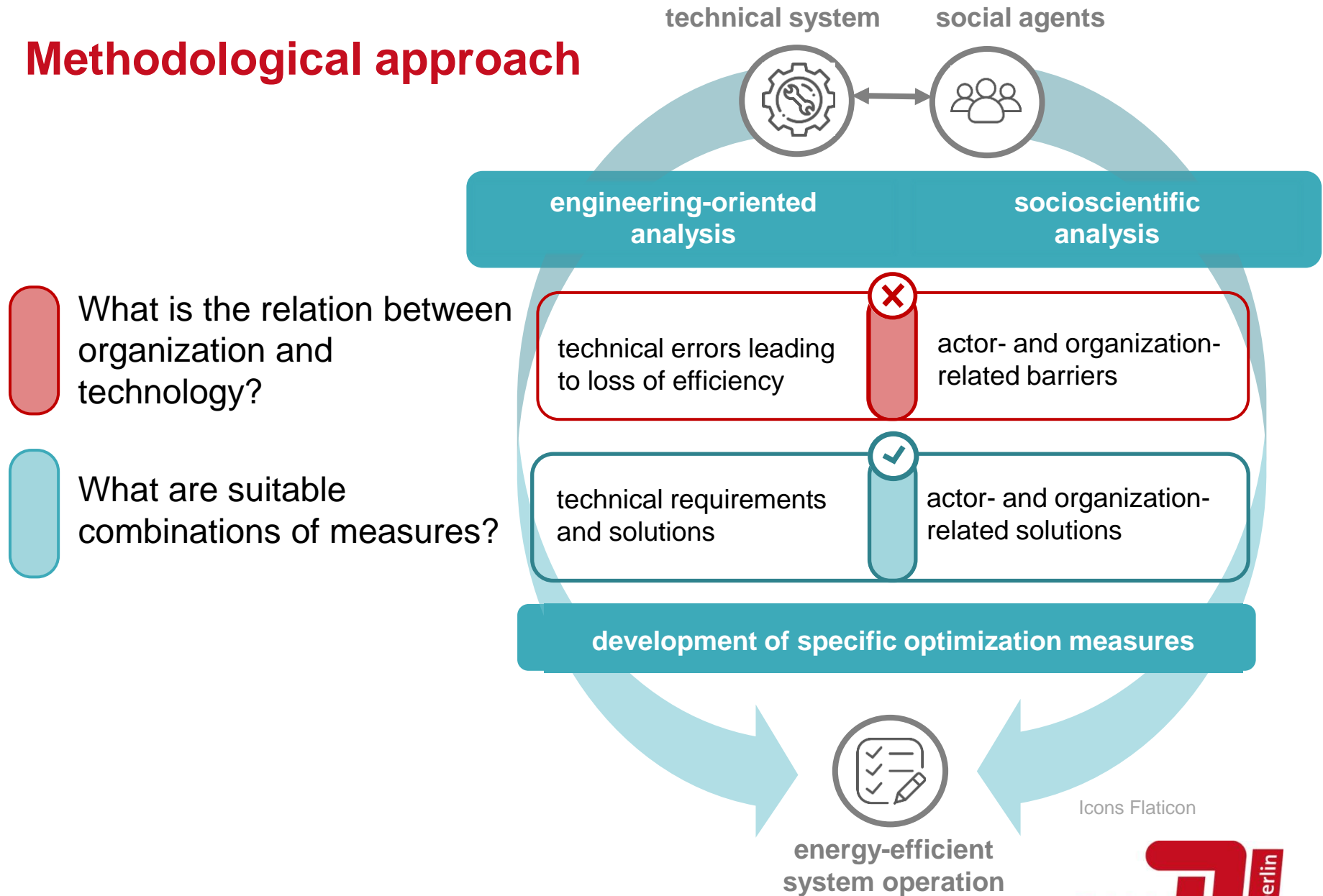


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Socio-technical analysis of 18 systems



Methodological approach

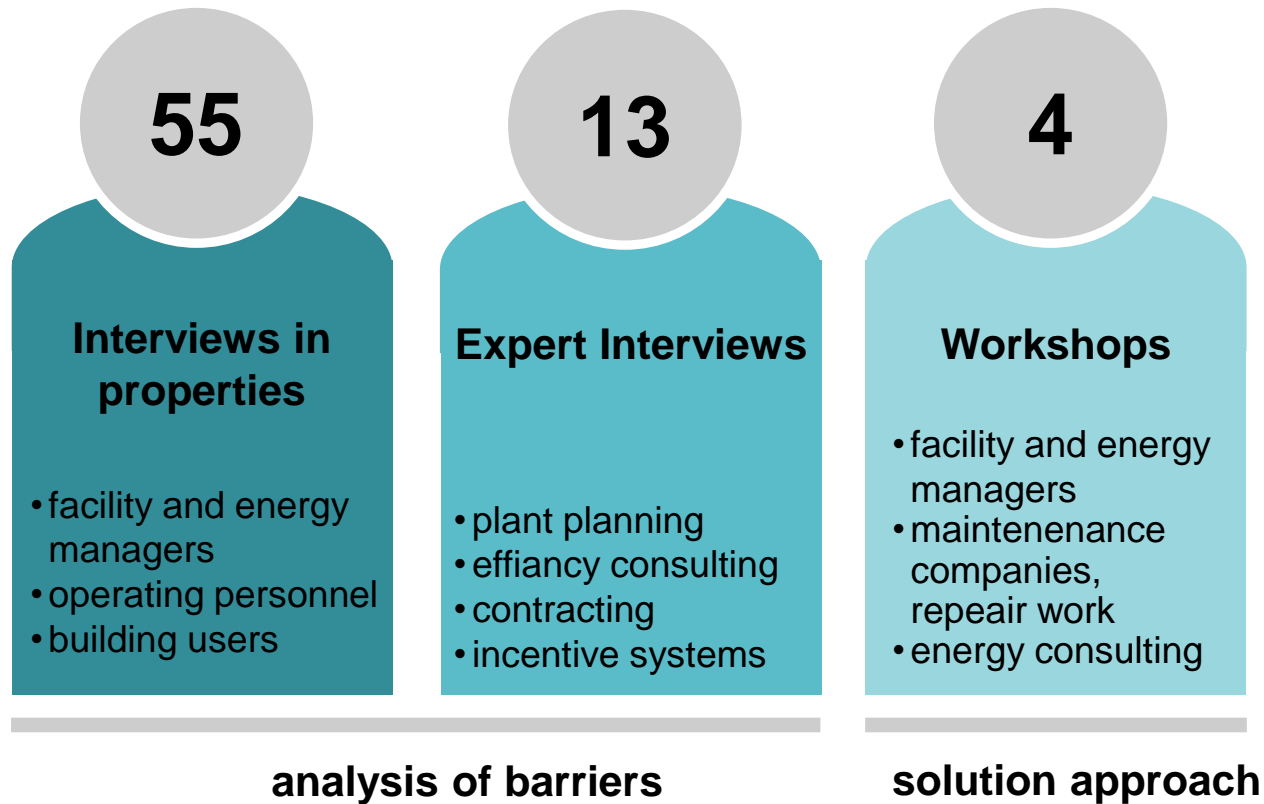


What is the relation between organization and technology?

What are suitable combinations of measures?

Icons Flaticon

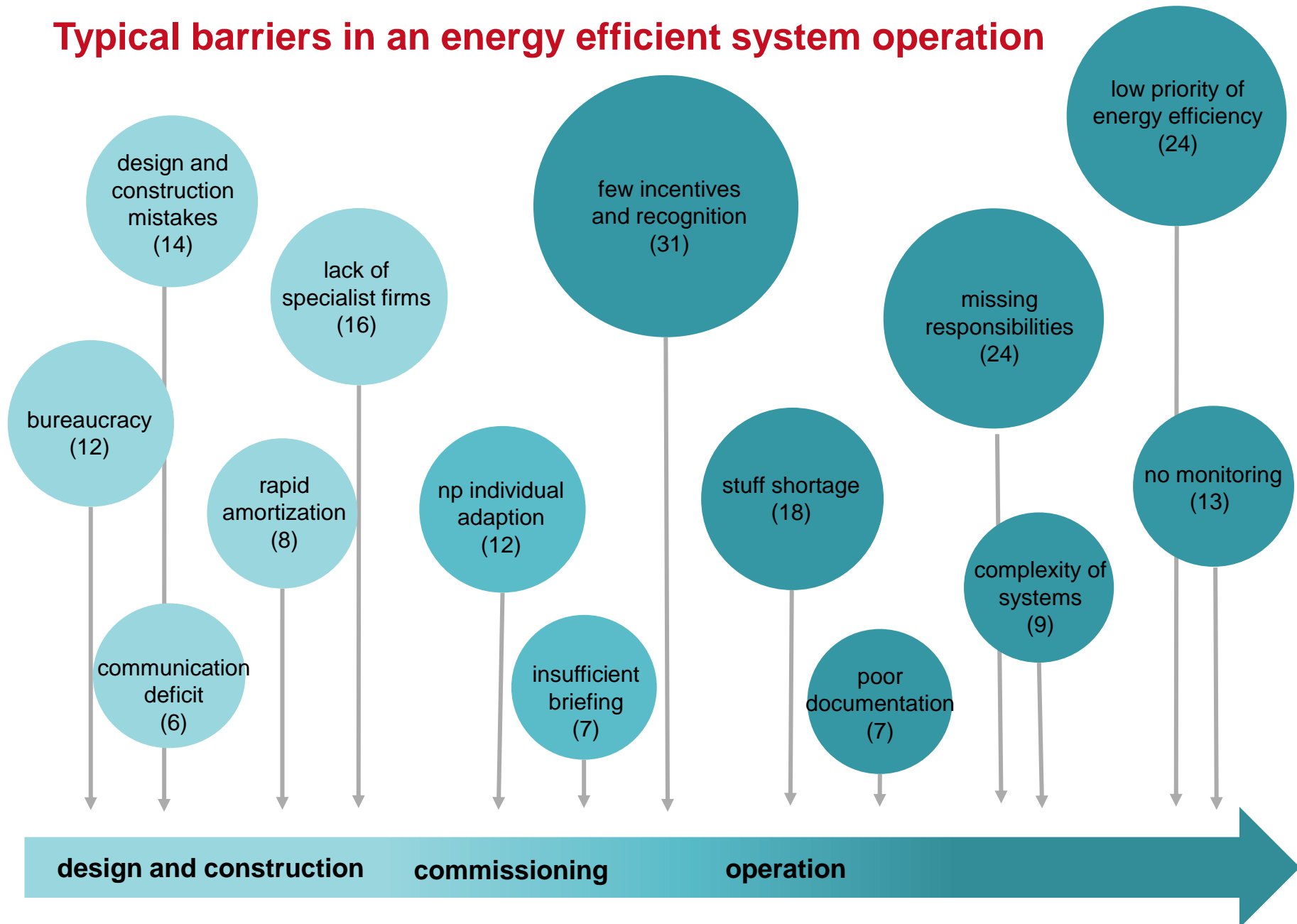
Socioscientific survey





What kind of socio-technical barriers exist?

Typical barriers in an energy efficient system operation



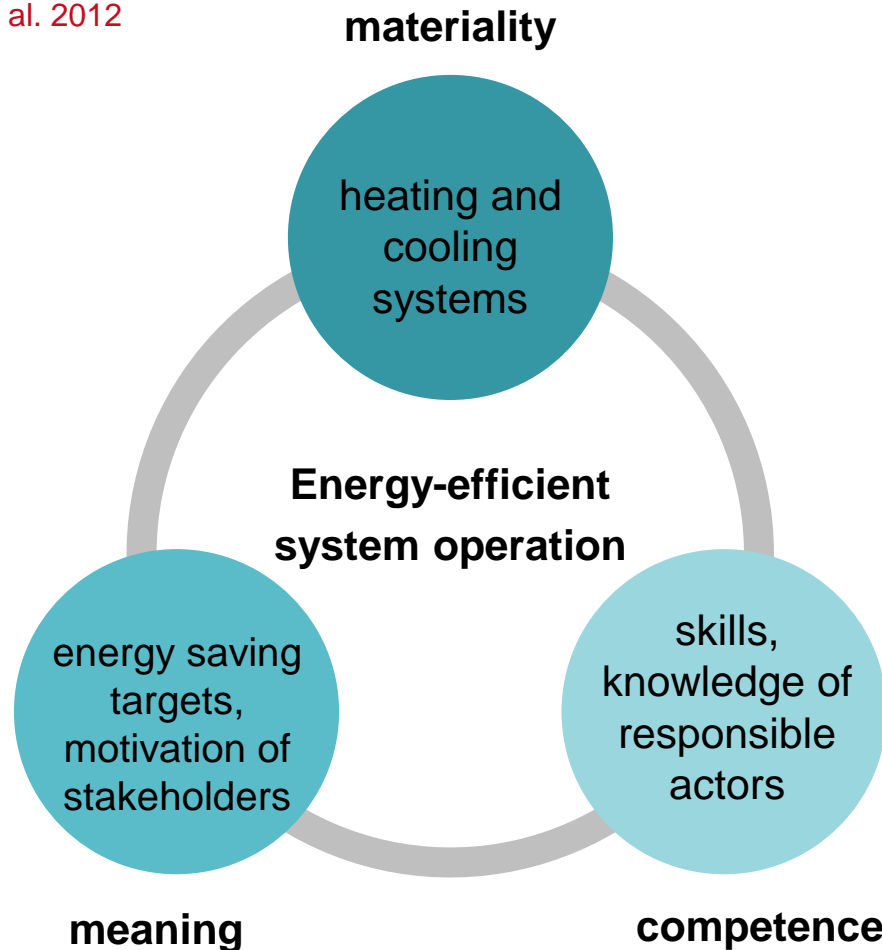
Data basis: 31 cases, including 18 institutions and 13 expert interviews



How can these barriers be explained theoretically and what conclusions can be drawn for practice?

Energy-efficient system operation as a social practice

Adapted from Shove et al. 2012



Shove, Elizabeth; Pantzar, Mika; Watson, Matt (2012): The Dynamics of Social Practice. Everyday Life and how it changes. London

Promoting an energy-efficient system operation

- resolve technical problems and errors
- adjust settings to current requirements and conditions
- user-friendly design of systems

materiality

**Energy-efficient
system
operation**

meaning

competence

- set realistic goals
- create incentives
- establish supportive work conditions
- involve the whole team

- regular exchange of information
- knowledge transfer and training courses
- assistance through trained staff
- building networks

Conclusion

- Even **innovative heating and cooling systems** are not automatically operated in an energy-efficient way
- Dealing with the **operation of systems** as a **social practice** is helpful for the design of adequate measures.
- **Supportive working structures** and a **tailored incentive system** are fundamentally required for an energy-efficient system operation

Practice transfer: webapp for a system optimization



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